Natural Engineer

Version 4.3.1

Reporting

Manual Order Number: NEE431-025ALL

This document applies to Natural Engineer version 4.3.1 and to all subsequent releases.

Specifications contained herein are subject to change, and these changes will be reported in subsequent revisions or editions.

Readers' comments are welcomed. Comments may be addressed to the Documentation Department at the address on the back cover. Internet users may send comments to the following e-mail address:

document@gensystems.com

TABLE OF CONTENTS

ABOUT THIS MANUAL

Purpose of this manual

This manual contains all the Reporting options for Natural Engineer version 4.3.1. It describes each of the reports that are available, how to select a display mode for the reports, as well as describing the graphical reporting.

The topics covered are:

- GenTree: Structure Analyzer
- GenMetrics: Complexity Metrics Analyzer
- Global Reports, accessible via the Options menu
- Environment Reports
  - Application Metrics, accessible via the Environment menu
  - Quality Logs, accessible via the Environment menu
  - Application Reports, accessible via the Environment menu
- Analysis Reports
  - Impact Reports, accessible via the Analysis menu
- Modification Reports
  - Modification Reports, accessible via the Modification menu.

Target Audience

The target audience for this manual is intended to be any User of Natural Engineer 4.3.1 at any level of experience.

Typographical Conventions used in this manual

The following conventions are used throughout this manual:

UPPERCASE TIMES	Commands, statements, names of programs and utilities referred to in text paragraphs appear in normal (Times) uppercase.
UPPERCASE BOLD COURIER	In illustrations or examples of commands, items in uppercase bold courier must be typed in as they appear.
< >	Items in angled brackets are placeholders for user-supplied information. For example, if asked to enter <file number>, you must type the number of the required file.
Underlined	Underlined parts of text are hyperlinks to other parts within the online source manual. This manual was written in MS-Word 97 using the "hyperlink" feature.

The following symbols are used for instructions:

⇒	Marks the beginning of an instruction set.
❑	Indicates that the instruction set consists of a single step.
1.	Indicates the first of a number of steps.

How this manual is organized

This manual is organized to reflect all the reporting options of Natural Engineer version 4.3.1 in the following chapters:

Chapter	Contents
1	Provides an overview on how to select the various different reporting display modes available in Natural Engineer.
2	Provides a description of each of the graphical type reporting options and how to use them.
3	Provides a description of each of the textual type reporting options and how to use them.

Terminology

It is assumed that you are familiar with general Natural and mainframe terminology, as well as the terms and concepts relating to MS-Windows environments. This section explains some terms that are specific to the Natural Engineer product.

Analysis

The Analysis process of Natural Engineer searches application data within the Natural Engineer Repository, according to specified Search Criteria and generates reports on the search results.

Application

An Application is a library or group of related libraries, which define a complete Application. In Natural Engineer, the Application can have a one-to-one relationship with a single library of the same name, or a library of a different name, as well as related steplibs. The Application refers to all the source code from these libraries, which Natural Engineer loads into the Repository.

Browser

An Internet Browser such as Microsoft Internet Explorer™ or Netscape™.

Category

Categories in Natural Engineer specify whether and how a Modification is applied to the Natural code. Valid categories are: Automatic change, Manual change, Reject the default Modification, No change to the data item, and the data item is in Generated Code.

A category is further broken down according to type of change (for example: Keyword, Literal, Data Item, Database Access, Definition).

Consistency

An option in the Analysis process that causes Natural Engineer to trace an Impact through the code, using left and right argument resolution to identify further code impacted by the code found.

Environment

The Environment process is the means by which Natural Engineer generates a structured view of the application code in the Natural Engineer Repository. This provides application analysis reports and inventory information on the application and is used as the basis for Impact Analysis.

Exception

An Exception is an Item identified as impacted that does not require a Modification. Where there are a few similar Exception Items, they can be treated as Exceptions, and rejected in the Modification review process. Where there are many similar (therefore not Exceptions), consideration should be given to changing the Search Criteria so they are not identified as impacted in the first place.

Generated Code

This is code which has been generated by a Natural code generator, such as Construct, and which is not normally modified directly in the Natural editor.

Impact

An Impact is an instance of a Natural code Item; e.g., data item or statement (a “hit” scored by the Analysis process) that matches the defined Search Criteria used in the Analysis process.

Iteration

An Iteration is one examination cycle of a field identified according to the specified Search Criteria. For example, one Iteration is reading the field right to left. Multiple Iterations are performed when the option of ‘Consistency’ or Multi Search is requested for Analysis, and Natural Engineer performs as many Iterations as necessary to exhaust all possibilities of expressing and tracing the field, and can be limited by a setting in the NATENG.INI file.

Library

A single library of source code, which exists in the Natural system file.

Modification

A Modification is a change suggested or made to an object or data item resulting in the required compliance of that object or data item. Modifications in Natural Engineer are classified according to Category and Type.

Presentation Split Process

The Presentation Split Process is a sub-function of the Object Builder function that removes screen I/O statements from current application objects and places them in generated subprograms.

Soft Link

A Soft Link is where a link between two objects has been defined using an alphanumeric variable rather than a literal constant.

Technical Split Process

The Technical Split Process is a sub-function of the Object Builder function that results in the encapsulation of each database access within the application, into a sub-program so that the application is separated into 'presentation and logic' and 'database access'.

Type

The Type of Modification available, for example: Data Item, Keyword and Literal.

TLM

Text Logic Members are used to contain the code required to support inclusion of common code into the application. An example of this is the code to include into an application before updating a database.

Related Literature

The complete set of Natural Engineer manuals consists of:

1. **Natural Engineer Concepts and Facilities (NEE431-006ALL)**

The Concepts and Facilities manual describes the many application systems problems and solutions offered by Natural Engineer, providing some guidelines and usage that can be applied to Natural applications.

2. **Natural Engineer Release Notes (NEE431-008ALL)**

The Release Notes describe all the information relating to the new features, upgrades to existing functions and documentation updates that have been applied to Natural Engineer 4.3.1.

3. **Natural Engineer Installation Guide (NEE431-010ALL)**

The Installation Guide provides information on how to install Natural Engineer on both PC and mainframe platforms.

4. **Natural Engineer Administration Guide (NEE431-040WIN)**

   Natural Engineer Administration Guide (NEE431-040MFR)

The Administration Guide provides information on all the various control settings available to control the usage of the different functions within Natural Engineer.

5. **Natural Engineer Application Management (NEE431-020WIN)**

   Natural Engineer Application Management (NEE431-020MFR)

The Application Management manual describes all the functions required to add Natural applications into the Repository.

6. **Natural Engineer Application Documentation (NEE431-022WIN)**

   Natural Engineer Application Documentation (NEE431-022MFR)

The Application Documentation manual describes all the available functions to document a Natural application within the Repository. These functions will help enhance / supplement any existing systems documentation such as BSD / CSD / Specifications etc.

7. **Natural Engineer Application Analysis and Modification (NEE431-023WIN)**

   Natural Engineer Application Analysis and Modification (NEE431-023MFR)

The Application Analysis and Modification manual describes all the available functions to carry out analysis of Natural applications; including basic keyword searches. The modification process is described and detailed to show how it can be applied to modify single selected objects within a Natural application, or the entire Natural application in one single execution.

8. **Natural Engineer Application Restructuring (NEE431-024WIN)**

   Natural Engineer Application Restructuring (NEE431-024MFR)

The Application Restructuring manual describes the analysis and modification functionality required to carryout some of the more sophisticated functions such as Object Builder.

9. **Natural Engineer Utilities (NEE431-080WIN)**

   Natural Engineer Utilities (NEE431-080MFR)

The Utilities manual describes all the available utilities found within Natural Engineer and, when and how they should be used.

10. **Natural Engineer Reporting (NEE431-025ALL)**

The Reporting manual describes each of the reports available in detail, providing report layouts, how to trigger the report and when the report data becomes available. The various report-producing mediums within Natural Engineer are also described.

11. **Natural Engineer Batch Processing [Mainframes] (NEE431-026MFR)**

The Batch Processing manual describes the various batch jobs (JCL) and their functionality.

1

REPORTING DISPLAY MODES

Chapter Overview

The various reporting options within Natural Engineer are displayed in several different ways depending on the option selected. This chapter will introduce the different display modes available and describe how they are invoked.

The reporting options are split into two main types:

1. Displaying Graphical Reports
2. Displaying Textual Reports

Displaying Graphical Reports

Graphical reports make use of any of the following display modes:

1. GenTree

This is one of Natural Engineer's own graphical display executables which when invoked, will display objects and/or data items in a tree-structure diagram using a legend of icons to distinguish the various individual components.

2. GenMetrics

This is one of Natural Engineer's own graphical display executables, which will either display in a list or graph format for complexity measurement statistics.

3. Third party spreadsheet packages

Third party spreadsheet packages are used to display report information in graph format.

Note: The display modes 1-3 and how they are invoked are explained in more detail in Chapter 2: Graphical Reporting Options.

4. Microsoft Visio 2000®

When a structure diagram option (Structure Flow Diagram or Program Flow Logic Diagram) is selected, it will invoke Microsoft Visio 2000®, which will draw and display the selected diagram.

Note: For more information on the Structure Flow Diagram and Program Flow Logic Diagram refer to the Natural Engineer Application Documentation for Windows manual.

Displaying Textual Reports

Textual reports make use of any of the following display modes:

- **Reporter**

The report data is shown using a formatted Natural Reporter report.

- **Screen**

The report data is shown on the Natural screen.

- **MS Excel**

The report data is shown using Microsoft Excel® spreadsheet package.

- **MS Word**

The report data is shown using Microsoft Word® word processing package.

- **Browser**

The report data is shown using an Internet browser.

The selection of which display mode to use is made when the textual report has been selected and either the Report Confirmation or Object List window has been displayed. This is driven by the NATENG.INI set up.

Report Confirmation Window

This screen is displayed when the report selected will show information for the whole application. Examples of reports that will invoke this window:

- Options➔Global Reports
  - Global DDM View
  - Impacted DDMs accessed by Objects
- Environment➔Application Reports
  - Source Code Summary
  - Natural Keywords Summary
  - DDM's Referenced Report
- Analysis➔Impact Reports
  - Search Criteria
  - Application Impact Summary
  - Object Impact Summary
- Modification➔Modification Reports
  - Application Modification Summary
  - Object Modification Summary
  - Database Data Requirements Modification Report.

The following Figure 1-1 illustrates the Report Confirmation window when the Application report Source Code Summary has been selected.

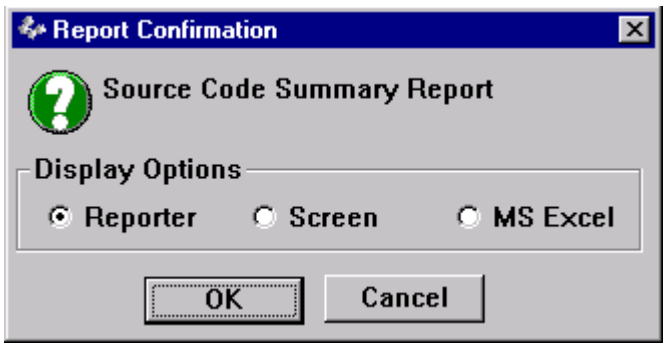


Figure 1-1 Report Confirmation window

SCREEN ITEMS	DESCRIPTION	
Report Name	The name of the report that has been selected is shown here.	
Display Options	Radio buttons which will select the display mode.	
	Reporter	Will display the report using Natural Reporter.
	Screen	Will display the report using Natural screen.
	MS Excel	Will display the report using Excel spreadsheet.

BUTTON NAME	DESCRIPTION
OK	The report display mode will be accepeted and the report will be displayed using the selected display mode.
Cancel	Will cancel the report display and return back to the main Natural Engineer screen.

To illustrate the three different report display modes, the following Figures show each of the display modes for the Source Code Summary report for the **HOSPITAL** application.

The following Figure 1-2 illustrates the Reporter display mode.

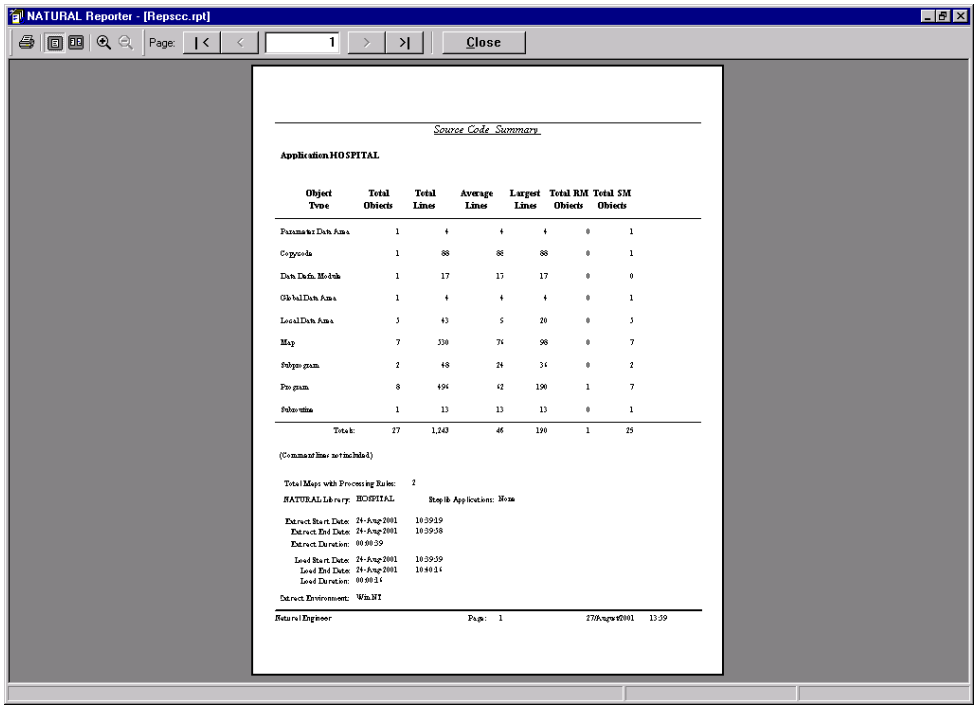


Figure 1-2 Reporter display mode

The following Figure 1-3 illustrates the Screen display mode.

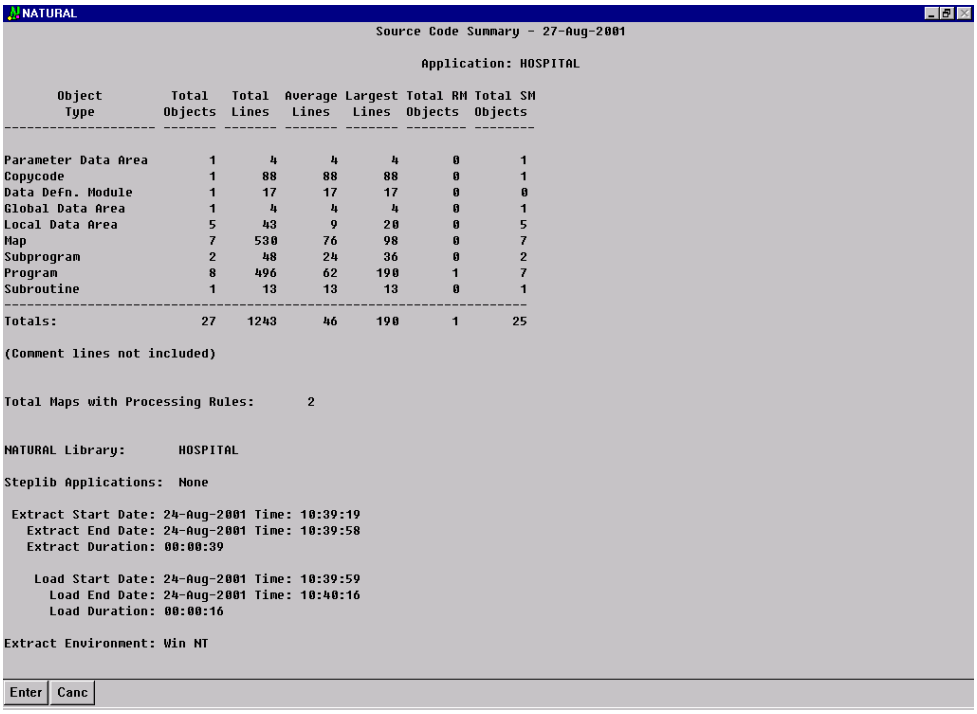
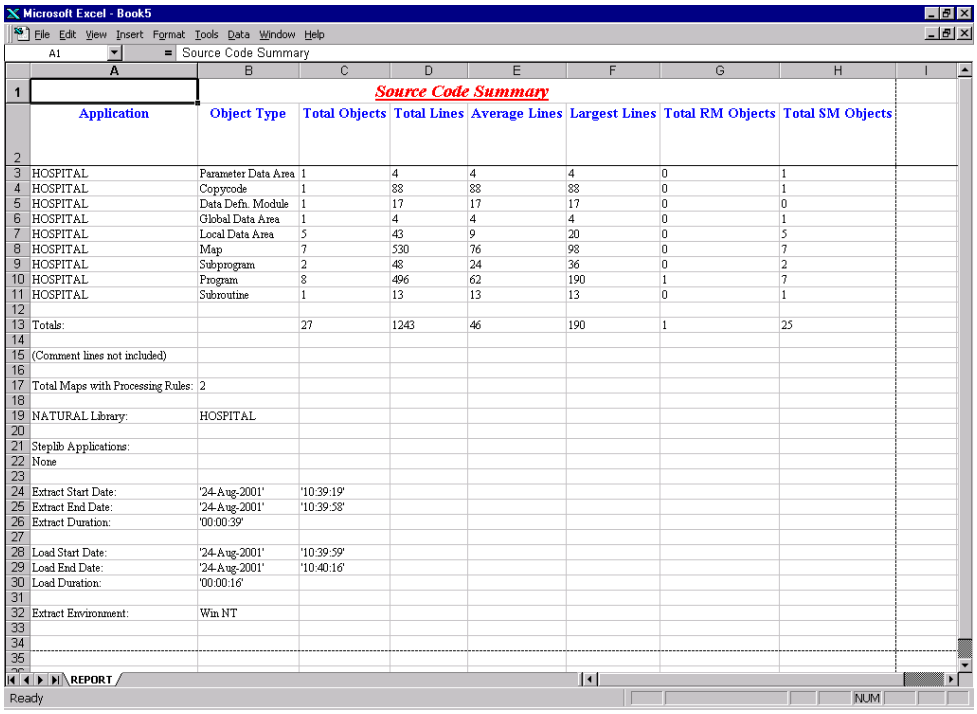


Figure 1-3 Screen display mode

The following Figure 1-4 illustrates the MS Excel display mode.



Application	Object Type	Total Objects	Total Lines	Average Lines	Largest Lines	Total RM Objects	Total SM Objects
HOSPITAL	Parameter Data Area	1	4	4	4	0	1
HOSPITAL	Copycode	1	88	88	88	0	1
HOSPITAL	Data Defn. Module	1	17	17	17	0	0
HOSPITAL	Global Data Area	1	4	4	4	0	1
HOSPITAL	Local Data Area	5	43	9	20	0	5
HOSPITAL	Map	7	530	76	98	0	7
HOSPITAL	Subprogram	2	48	24	36	0	2
HOSPITAL	Program	8	496	62	190	1	7
HOSPITAL	Subroutine	1	13	13	13	0	1
Totals:		27	1243	46	190	1	25

(Comment lines not included)

Total Maps with Processing Rules: 2

NATURAL Library: HOSPITAL

Steplib Applications:
None

Extract Start Date:	'24-Aug-2001' '10:39:19'
Extract End Date:	'24-Aug-2001' '10:39:58'
Extract Duration:	'00:00:39'
Load Start Date:	'24-Aug-2001' '10:39:59'
Load End Date:	'24-Aug-2001' '10:40:16'
Load Duration:	'00:00:16'
Extract Environment:	Win NT

Figure 1-4 MS Excel display mode

Object List Window

This screen is displayed when the report selected will show information for the whole application, providing an option to refine the report for a single object, a group of objects or the whole application. Examples of reports that will invoke this window:

- Environment➔Application Reports
  - Objects Referencing Objects
  - Objects Referenced by Objects
  - DDMs Accessed by Objects
- Analysis➔Impact Reports
  - Data Item Impact Inventory
- Modification➔Modification Reports
  - Data Item Inventory Modification

The following Figure 1-5 illustrates the Object List window when the Application report Objects Referencing Objects has been selected.

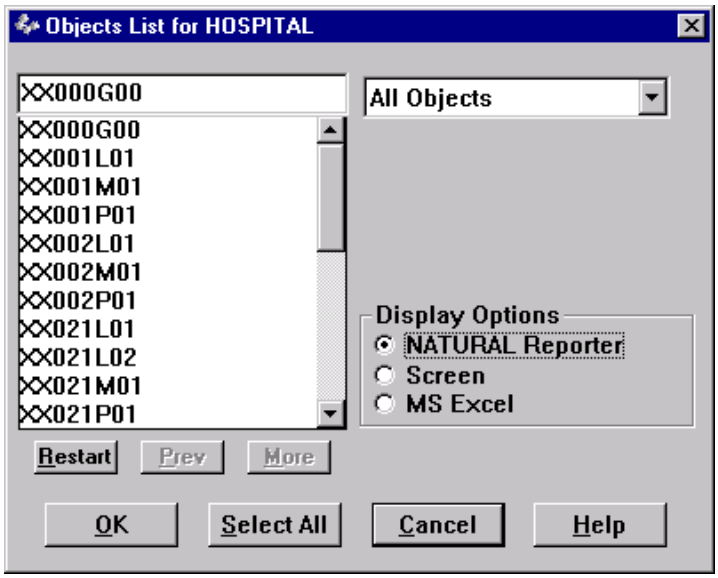


Figure 1-5 Object List window

SCREEN ITEMS	DESCRIPTION
Object name	The name of the object to be selected if only a single object is to be reported on.
Object Types	This controls the list of objects available in the objects list. Available selections are: • **All Objects** • **Programs** • **Maps** • **Data Defn. Modules** • **Parameter Data Areas** • **Global Data Areas** • **Local Data Areas** • **Copycodes** • **Subprograms** • **Subroutines** • **Helproutines** • **Dialogs**
Object List	Scrollable list of all the objects available within the application. *Note: The list of objects is controlled by the Object Types selection. For Example: if the Object Types is set to Programs, then the Object List will only show the objects which have a type of Program within the application.*

SCREEN ITEMS	DESCRIPTION	
Display Options	Radio buttons which will select the display mode.	
	Natural Reporter	Will display the report using Natural Reporter.
	Screen	Will display the report using Natural screen.
	MS Excel	Will display the report using Excel spreadsheet.

BUTTON NAME	DESCRIPTION
Restart	Allows the Object List to be restarted from a particular object name.
Prev	Scrolls the object list to previous page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
More	Scrolls the object list forward one page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
OK	The report display mode will be accepeted and the report will be displayed using the selected display mode and objects.
Select All	Selects all the objects available in the objects list.
Cancel	Will cancel the report display and return back to the main Natural Engineer screen.
Help	Invokes the Object List help.

Note: For more information on the NATENG.INI file parameter LISTBOXMAX refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

There are several variations for the Object List window. These are described below with an outline of the differences.

Keywords List Window

This window is presented when the Application Report: Natural Keywords Referenced is selected.

The following Figure 1-6 illustrates the Keyword List window.

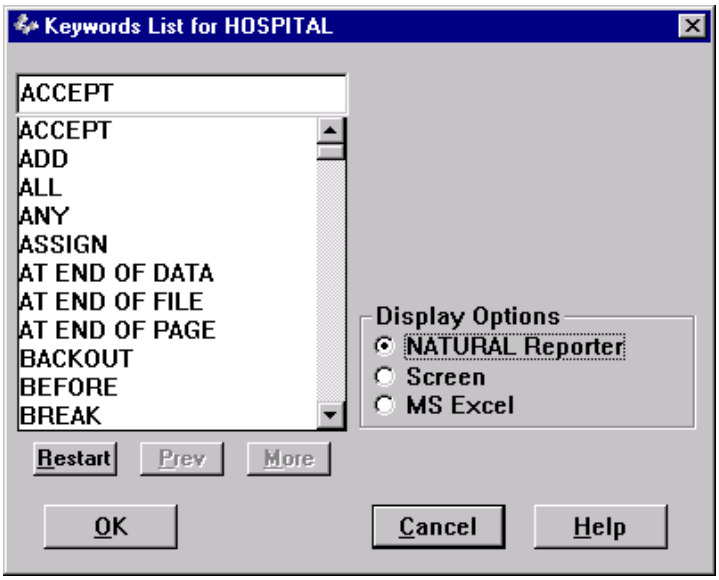


Figure 1-6 Keyword List window

The Keywords List window shows a list of Keywords rather than objects and there is no **Select All** button, otherwise all the options are the same as for the Objects List screen.

Field List Window

This window is presented when the Application Report: Data Item Usage Inventory is selected.

The following Figure 1-7 illustrates the Field List window.

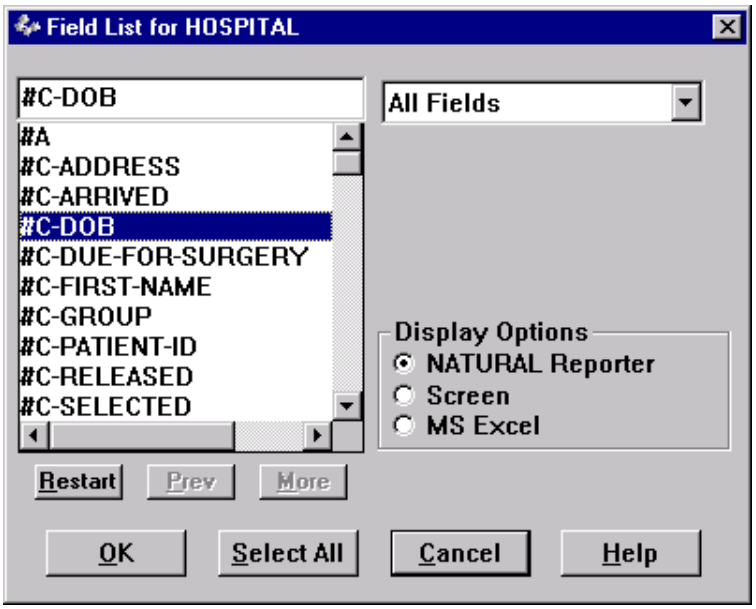


Figure 1-7 Field List window

The Field List window shows a list of Fields that is applicable to the currently selected application rather than objects; otherwise all the options are the same as for the Objects List screen.

Browser Reporting Option

There are three report options that use the Internet browser to display them:

- Environment➔Application Reports
  - View Source Code
- Analysis➔Impact Reports
  - View Impacted Source Code
- Modification➔Modification Reports
  - View Modification Source Code

Each one of these will invoke a different version of the Object List window with the relevant options available.

Object List Window for View Source Code

The Object List window for View Source Code is similar to the standard Object List window except that the Display options are not shown, only Browser Options are available.

The following Figure 1-8 illustrates the Object List window when the Application report View Source Code has been selected.

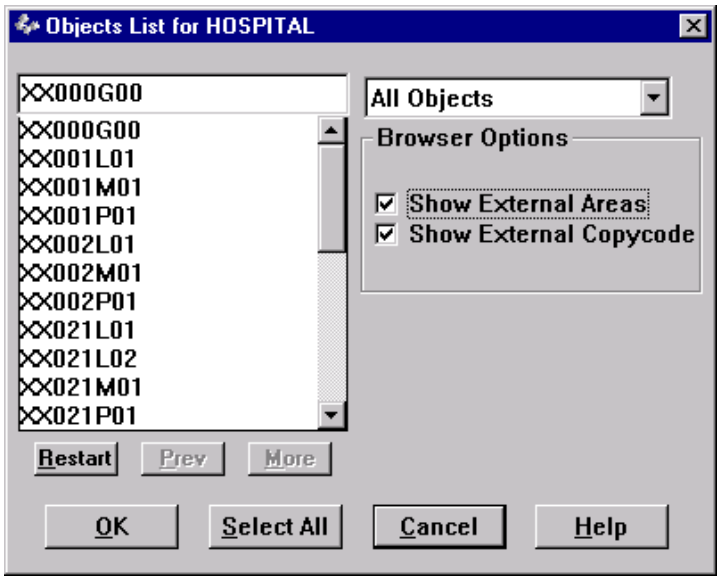


Figure 1-8 Object List window for View Source Code

SCREEN ITEMS	DESCRIPTION
Object name	The name of the object to be selected if only a single object is to be reported on.
Object Types	This controls the list of objects available in the objects list. Available selections are: • **All Objects** • **Programs** • **Maps** • **Data Defn. Modules** • **Parameter Data Areas** • **Global Data Areas** • **Local Data Areas** • **Copycodes** • **Subprograms** • **Subroutines** • **Helproutines** • **Dialogs**
Object List	Scrollable list of all the objects available within the application. *Note: The list of objects is controlled by the Object Types selection. For Example: if the Object Types is set to Programs, then the Object List will only show the objects which have a type of Program within the application.*

SCREEN ITEMS	DESCRIPTION
Browser Options	Check boxes which will select: **Show External Areas** If checked, will display the contents of the included Data area within the source code of the selected object. If un-checked, then no included Data area details will be shown, i.e., will show as **'USING XX001L01'** where XX001L01 is the external object for the included local data area. **Show External Copycode** If checked, will display the contents of the included Copycode within the source code of the selected object. If un-checked, then no copycode details will be shown, i.e., will show as **'INCLUDE XX001C01'** where XX001C01 is the external object containing the copycode.

BUTTON NAME	DESCRIPTION
Restart	Allows the Object List to be restarted from a particular object name.
Prev	Scrolls the object list to previous page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
More	Scrolls the object list forward one page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
OK	The report display mode will be accepeted and the report will be displayed using the selected display mode and objects.
Select All	Selects all the objects available in the objects list.
Cancel	Will cancel the report display and return back to the main Natural Engineer screen.
Help	Invokes the Object List help.

Note: For more information on the NATENG.INI file parameter LISTBOXMAX refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Object List Window for View Impacted Source Code

The Object List window for View Impacted Source Code is similar to the Object List window for View Source Code described previously. The only difference being the Browser Options that are available.

The following Figure 1-9 illustrates the Object List window when the Impact report: View Impacted Source Code has been selected.

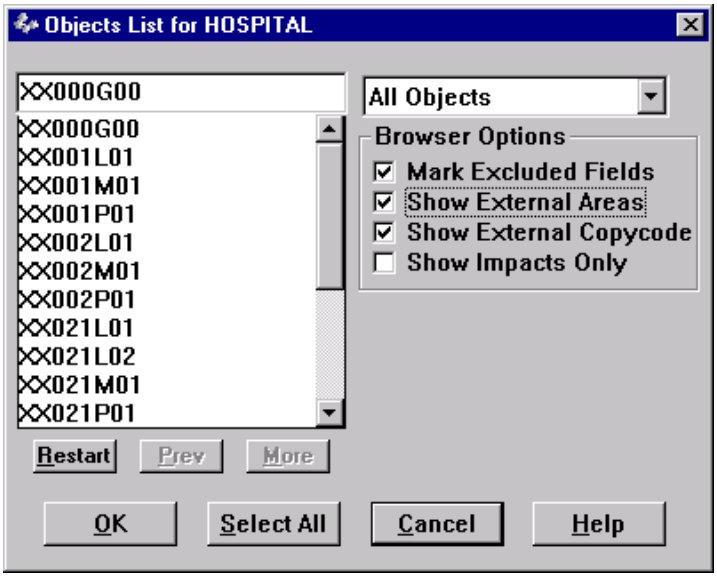


Figure 1-9 Object List window for View Impacted Source Code

SCREEN ITEMS	DESCRIPTION
Object name	The name of the object to be selected if only a single object is to be reported on.
Object Types	This controls the list of objects available in the objects list. Available selections are: • **All Objects** • **Programs** • **Maps** • **Data Defn. Modules** • **Parameter Data Areas** • **Global Data Areas** • **Local Data Areas** • **Copycodes** • **Subprograms** • **Subroutines** • **Helproutines** • **Dialogs**
Object List	Scrollable list of all the objects available within the application. *Note: The list of objects is controlled by the Object Types selection. For Example: if the Object Types is set to Programs, then the Object List will only show the objects which have a type of Program within the application.*
Browser Options	Check boxes which will select: **Mark Excluded Fields** If checked, will display any fields that have been marked as Excluded. If un-checked, will not display any Excluded fields. **Show External Areas** If checked, will display the contents of the included Data area within the source code of the selected object. If unchecked, then no included Data area details will be shown, i.e., will show as **'USING XX001L01'** where XX001L01 is the external object for the included local data area. **Show External Copycode** If checked, will display the contents of the included Copycode within the source code of the selected object. If unchecked, then no copycode details will be shown, i.e., will show as **'INCLUDE XX001C01'** where XX001C01 is the external object containing the copycode.

SCREEN ITEMS	DESCRIPTION
	Show impacts only If checked, will only display the statement lines that have been impacted. If unchecked, will display both the impacted and non-impacted statement lines.

BUTTON NAME	DESCRIPTION
Restart	Allows the Object List to be restarted from a particular object name.
Prev	Scrolls the object list to previous page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
More	Scrolls the object list forward one page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
OK	The report display mode will be accepted and the report will be displayed using the selected display mode and objects.
Select All	Selects all the objects available in the objects list.
Cancel	Will cancel the report display and return back to the main Natural Engineer screen.
Help	Invokes the Object List help.

Note: For more information on the NATENG.INI file parameter LISTBOXMAX refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Object List Window for View Modification Source Code

The Object List window for View Modification Source Code only allows for an object to be selected. There are no Browser Options available.

The following Figure 1-10 illustrates the Object List window when the Modification report View Modification Source Code has been selected.

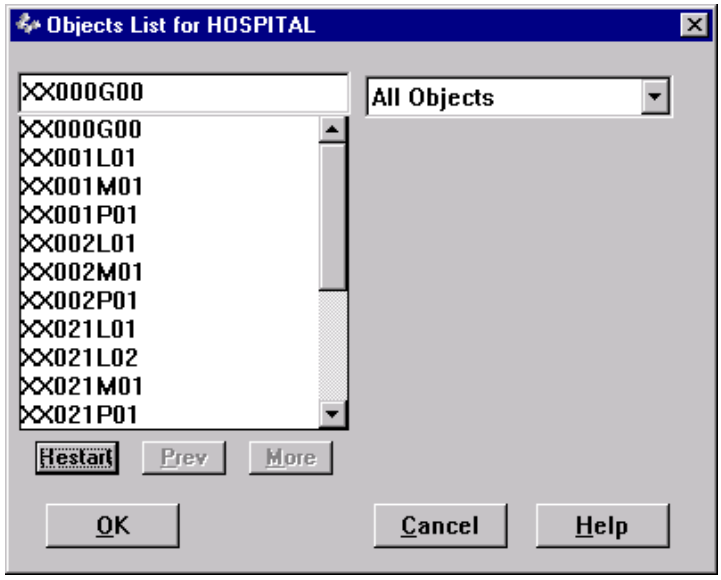


Figure 1-10 Object List window for View Modification Source Code

SCREEN ITEMS	DESCRIPTION
Object name	The name of the object to be selected if only a single object is to be reported on.
Object Types	This controls the list of objects available in the objects list. Available selections are: • **All Objects** • **Programs** • **Maps** • **Data Defn. Modules** • **Parameter Data Areas** • **Global Data Areas** • **Local Data Areas** • **Copycodes** • **Subprograms** • **Subroutines** • **Helproutines** • **Dialogs**
Object List	Scrollable list of all the objects available within the application. *Note: The list of objects is controlled by the Object Types selection. For Example: if the Object Types is set to Programs, then the Object List will only show the objects which have a type of Program within the application.*

BUTTON NAME	DESCRIPTION
Restart	Allows the Object List to be restarted from a particular object name.
Prev	Scrolls the object list to previous page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
More	Scrolls the object list forward one page. This button will be available/unavailable depending on the value specified in the LISTBOXMAX parameter in the NATENG.INI file.
OK	The report display mode will be accepeted and the report will be displayed using the selected display mode and objects.
Cancel	Will cancel the report display and return back to the main Natural Engineer screen.
Help	Invokes the Object List help.

Note: For more information on the NATENG.INI file parameter LISTBOXMAX refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

2

GRAPHICAL REPORTING OPTIONS

Chapter Overview

This chapter reviews all the graphical reporting options available to Natural Engineer.

The following graphical reporting options are covered:

- GenTree
- GenMetrics
- Environment: Application Metrics Graphics

GenTree

GenTree is a structure analyzer used in several Natural Engineer functions to display graphical and structured details within and between objects and data items.

GenTree automatically refreshes the display each time the data changes, if however the data has not been refreshed, pressing the 'ESC' key will force it to refresh.

GenTree is available for the following functions within Natural Engineer:

- **Field Viewer**

  This is accessed from the menu Environment➔Field Explorer➔Field Viewer. This option will open the Field Viewer window. GenTree will be automatically invoked when an object and then any data item from the Elements list is selected.

  GenTree displays objects referencing a specific data item.

- **Object Viewer**

  This is accessed from the menu Environment➔Object Explorer➔Object Viewer. This option will open the Object Viewer window. GenTree will be automatically invoked when any object from the object list is selected.

  For programming objects, GenTree displays objects referenced from within an object. For DDMs, shows all objects that use the DDM and how the DDM is accessed.

- **Entry Point Structure Diagram**

  This is accessed from the menu Environment➔Object Explorer➔Entry Point Structure Diagram. This option will open the Entry points selection window. Once all entry points have been selected, use of the **OK** button will invoke GenTree.

  GenTree displays all the objects referenced from defined starting objects within an application.

- **View Structure Diagram for Search Criteria**

  This is accessed from the menu Analysis➔Impact Element Maintenance➔ Options ➔View Structure Diagram for Search Criteria. This option will open the Object List selection window. GenTree will be invoked when either a single object or all objects have been selected.

  GenTree displays the impacts made for specified search criteria either within one selected object or, all impacted objects within an application.

GenTree Structure Analyzer Window

The GenTree Structure Analyzer window is the same format for each of the Natural Engineer functions that invoke it.

The following Figure 2-1 illustrates the GenTree diagram for the Entry Point Structure Diagram function.

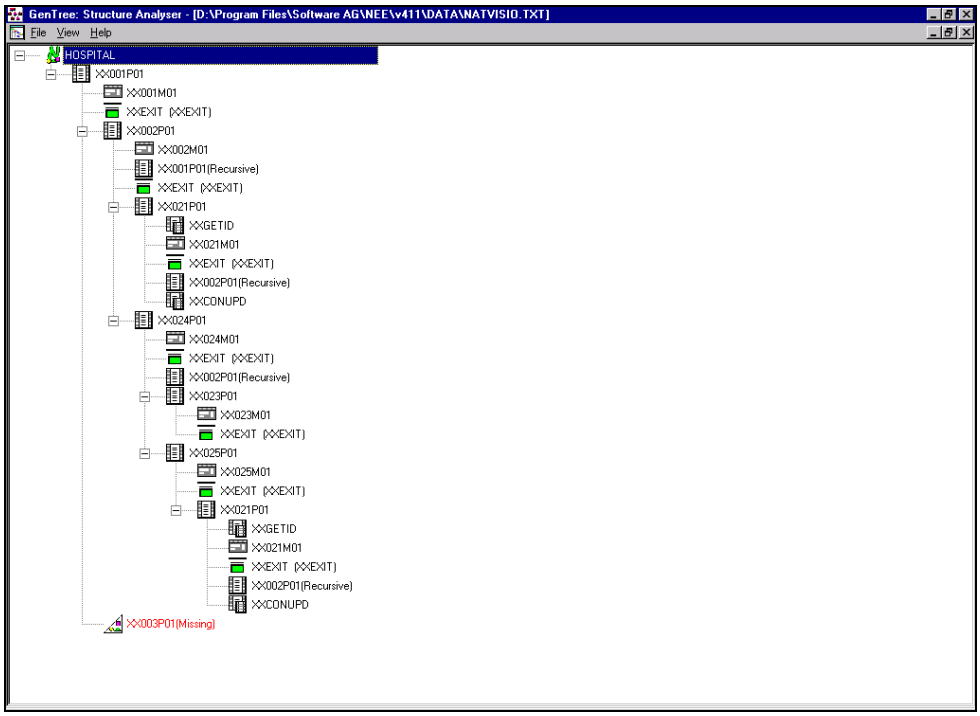


Figure 2-1 GenTree diagram for Entry Point Structure Diagram

MENU ITEMS	OPTIONS	DESCRIPTION
File	**Open**	Allows you to Open a previously saved GenTree diagram.
	Save As	Allows you to Save a GenTree diagram.
	Print Page	Allows you to print the GenTree diagram on your default printer.
	Exit	Exits the GenTree diagram.
View	**Refresh**	Refreshes the GenTree diagram page.
	History	A list of opened diagram files; a tick identifies the object currently being viewed. You can select any one of them to see them displayed within GenTree.
Help	**Icon Description**	Displays a legend showing each GenTree icon and its description.
	About	Displays the GenTree version information.

GenTree Context Menu

For each object displayed on the GenTree diagram, it is possible to obtain further information about the object via a context menu by using the right hand mouse button with a single click.

The following Figure 2-2 illustrates the GenTree object context menu options.

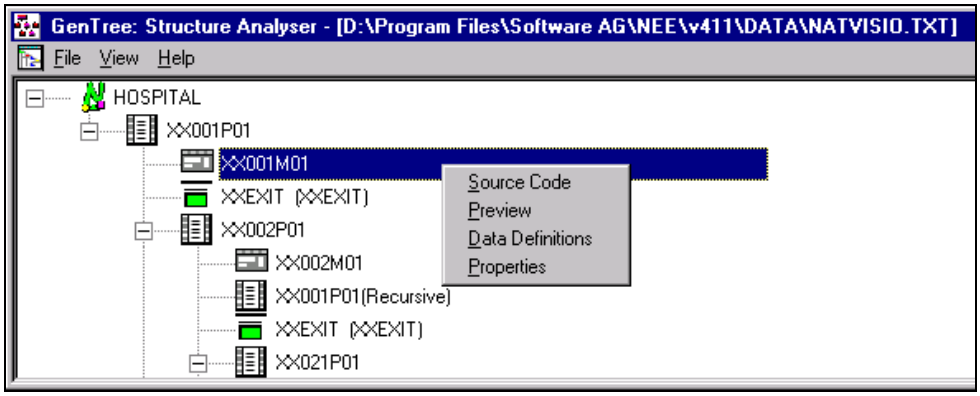


Figure 2-2 GenTree object context menu options

CONTEXT MENU ITEM	DESCRIPTION
Source Code	This will invoke the GenSource source code window to provide a listing of the source code for the object.
Preview	This is only available for a Map object. Will display the map as seen by the user in a separate window.
Data Definitions	Will list the objects data items with their format and length in a separate window.
Properties	Will show details pertaining to the object in a separate window. These include Application, Library, Program, Object Mode, Object Type, Statement Count and Comment Count.

Source Code

When this context menu option is selected, the GenSource source code window will be displayed with the source code for the selected object. The source code listing will match the object type of the selected object. For Example:

OBJECT TYPE	DISPLAY FORMAT
Global Data Area **Local Data Area** **Parameter Data Area**	Will be displayed the same as in the Natural data area editor.
Map	Will be displayed the same as using the **List** command in the Natural map editor.
Programs **Subprograms** **Subroutines** **Copycodes** **Helproutines**	Will be displayed the same as using the Natural program editor.
Dialogs	Will be displayed the same as using the **List** command in the Natural dialog editor.
DDMs	Will be displayed the same as using the **List** command in the Natural DDM editor.

The following Figure 2-3 illustrates the GenSource source code window for a map object.

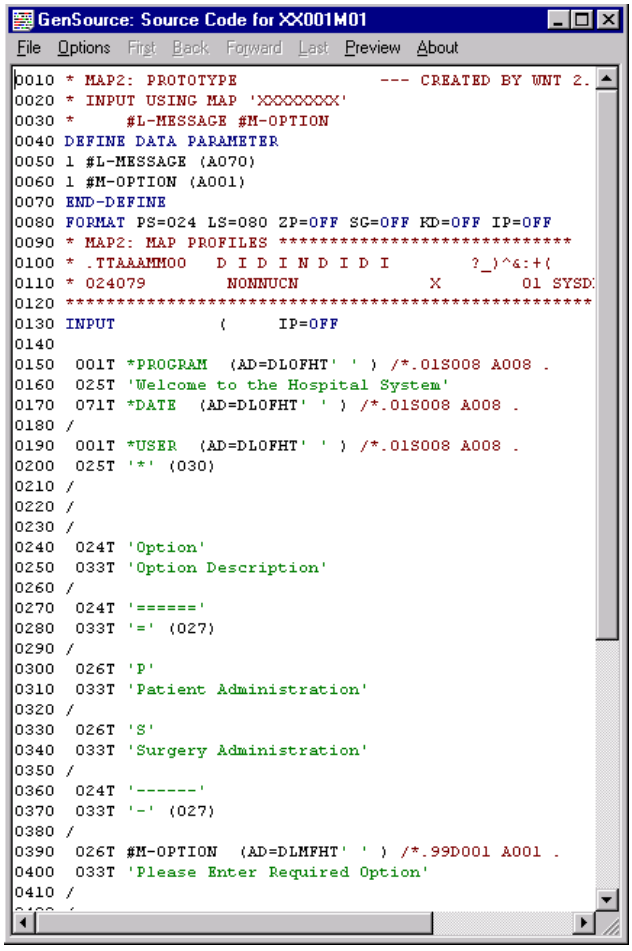


Figure 2-3 GenSource source code window for a map object

MENU ITEMS	OPTIONS	DESCRIPTION
File	**Print**	Prints the GenTree diagram being displayed.
	History	A list of visited items can be found under the File menu, a tick identifies the object currently being viewed. You can select any one of them to see the source code.
	Exit	Exits the GenSource window.
Options	**Data Definition**	Lists the data items with their format and length for the currently selected object in a separate window.
	Properties	Shows the header information for the currently selected object in a separate window.
	Find	Uses standard windows' functionality to find an occurrence of a string.
	Find Next	Uses standard windows' functionality to find the next occurrence of a string.
	Text Size	Choose a different font size for the source code. *Note: This affects the size of text used when printing the source code.*
	Colour Syntax	If selected (marked by a tick) will color the source code as per the Natural Editor.
	Refresh	Refreshes the window.

The following menu items perform direct functions when selected and are used as navigational aids within GenSource.

MENU ITEMS	DESCRIPTION
First	Shows the first selected object, at the beginning of the history list.
Back	Shows the previous object in the history list.
Forward	Shows the next object in the history list.
Last	Shows the last selected object, at the end of the history list.
Preview	This is only available for a Map object. Will display the map as seen by the user in a separate window.
About	Displays the GenSource version information.

It is also possible to select a new source code from within the displayed object by using the mouse double click on the object name within the source code. For Example:

For the statement: **0100 INPUT USING MAP 'XX001M01'**

If a double click is used on the map name XX001M01, the source code for the map will be displayed within the GenSource window.

Note: If steplibs are being used and the database is not active, GenTree will only be able to find source code for those objects that are not in a steplib library.

Preview

When this context menu option is selected, a test view of the map object is displayed in a separate window.

This option is only available for objects with an object type of map.

The following Figure 2-4 illustrates the preview map window.

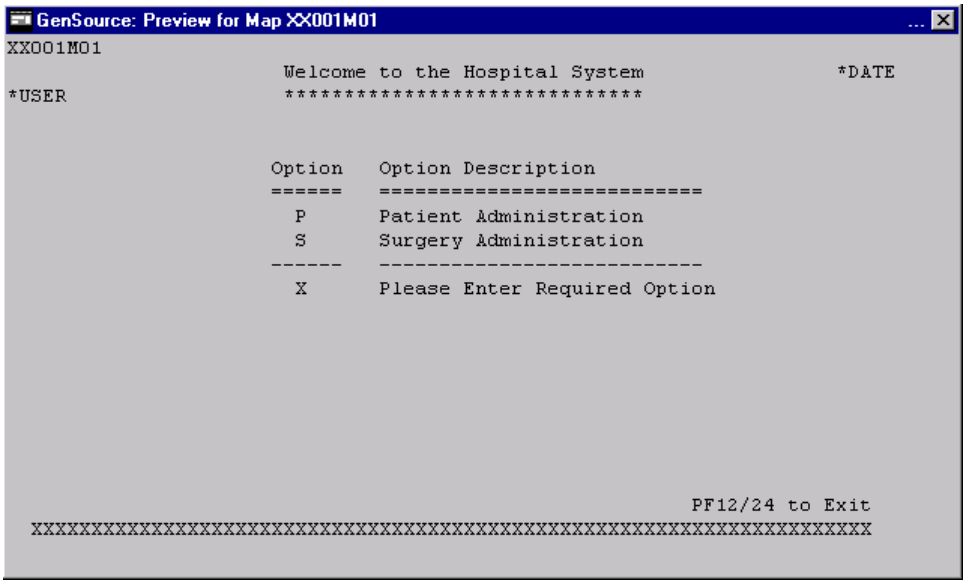


Figure 2-4 Preview map window

Once viewed the Preview map window can be closed using the close window button in the title bar.

Data Definitions

When this context menu option is selected, a GenSource Data Definitions window will be displayed with the data definitions for the selected object.

The following Figure 2-5 illustrates the GenSource Data Definitions window.

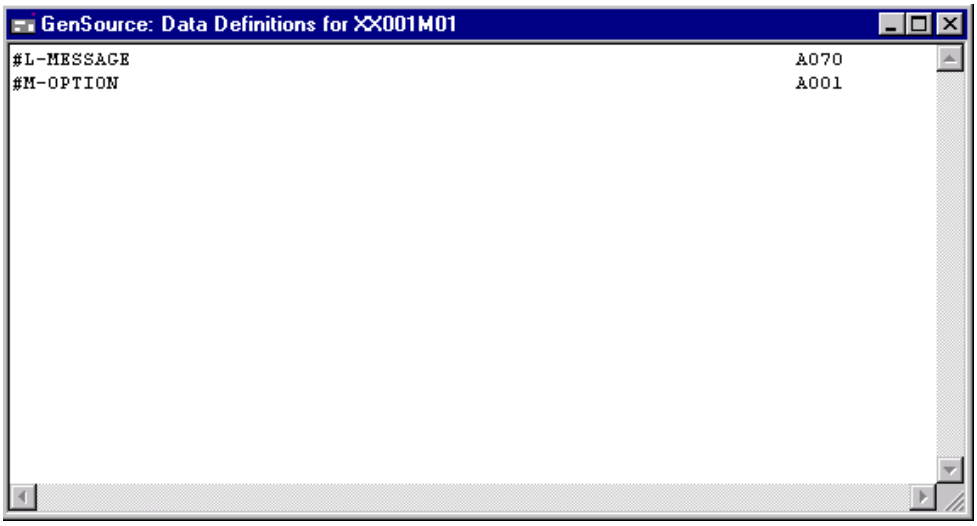


Figure 2-5 GenSource Data Definitions window

Once viewed the GenSource Data Definitions window can be minimized/maximized or closed using the standard window buttons in the title bar.

Properties

When this context menu option is selected, the GenTree Properties window will be displayed with property information on the selected object.

The following Figure 2-6 illustrates the GenTree Properties window.

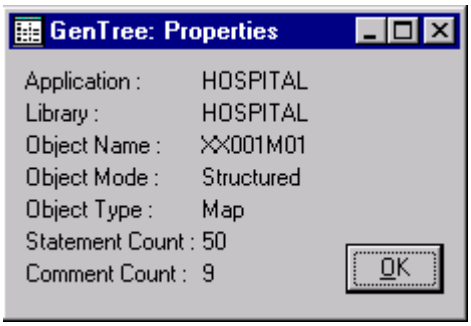


Figure 2-6 GenTree Properties window

SCREEN ITEMS	DESCRIPTION
Application	The name of the application as defined in Natural Engineer.
Library	The name of the Natural library from where the object was extracted.
Object Name	The object name.
Object Mode	The Natural programming mode of the object - Structured or Reporting.
Object Type	The object type of the object.
Statement Count	The total number of executable Natural statement lines in the object.
Comment Count	The total number of comment lines in the object.

Once viewed the GenSource Data Definitions window can be minimized/maximized or closed using the standard window buttons in the title bar. Using the **OK** button will also close the window.

GenMetrics

GenMetrics is the analysis tool for interactively displaying output of the complexity metrics. This can be for the whole application, for individually selected objects or a group of object types.

GenMetrics uses industry standard Halstead and McCabe complexity metrics calculations based on information built up in the Repository during the load process. The results for these calculations are displayed in a GenMetrics window along with a textual report in Reporter, Screen or Excel display mode.

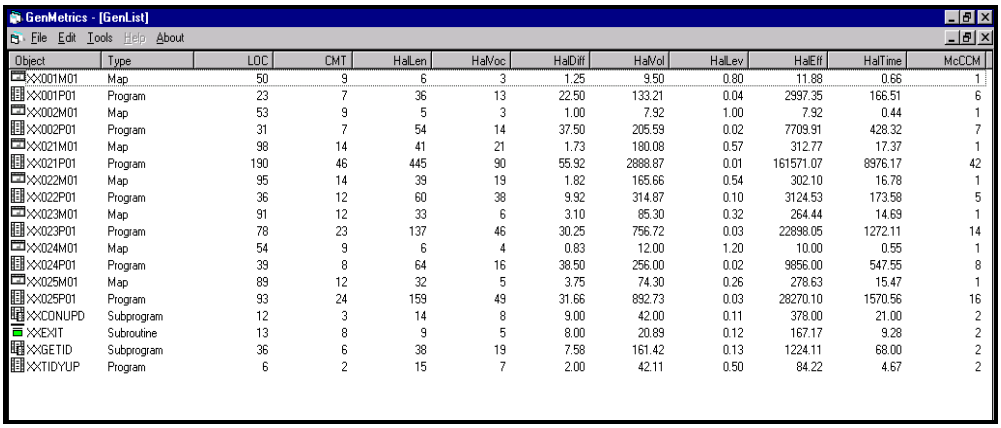
Note: Refer to Chapter 3:Textual Reporting Options, section Object Statistics for more information on the textual report.

The metrics are calculated internally as part of the post process of Natural Engineer. This is controlled by the metrics setting in the LOAD section of the NATENG.INI file.

Note: For more information on the NATENG.INI file and the LOAD section refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

GenMetrics Window

This is accessed by using the following menu navigation Environment➔Application Metrics➔Reports➔Object Statistics. The following Figure 2-7 illustrates the GenMetrics window.



Object	Type	LOC	CMT	HalLen	HalVoc	HalDiff	HalVol	HalLev	HalEff	HalTime	McCCM
XX001M01	Map	50	9	6	3	1.25	9.50	0.80	11.88	0.66	1
XX001P01	Program	23	7	36	13	22.50	133.21	0.04	2997.35	166.51	6
XX002M01	Map	53	9	5	3	1.00	7.92	1.00	7.92	0.44	1
XX002P01	Program	31	7	54	14	37.50	205.59	0.02	7709.91	428.32	7
XX021M01	Map	98	14	41	21	1.73	180.08	0.57	312.77	17.37	1
XX021P01	Program	190	46	445	90	55.92	2888.87	0.01	161571.07	8976.17	42
XX022M01	Map	95	14	39	19	1.82	165.66	0.54	302.10	16.78	1
XX022P01	Program	36	12	60	38	9.92	314.87	0.10	3124.53	173.58	5
XX023M01	Map	91	12	33	6	3.10	85.30	0.32	264.44	14.69	1
XX023P01	Program	78	23	137	46	30.25	756.72	0.03	22898.05	1272.11	14
XX024M01	Map	54	9	6	4	0.83	12.00	1.20	10.00	0.55	1
XX024P01	Program	39	8	64	16	38.50	256.00	0.02	9856.00	547.55	8
XX025M01	Map	89	12	32	5	3.75	74.30	0.26	278.63	15.47	1
XX025P01	Program	93	24	159	49	31.66	892.73	0.03	28270.10	1570.56	16
XXCONUPD	Subprogram	12	3	14	8	9.00	42.00	0.11	378.00	21.00	2
XXEXIT	Subroutine	13	8	9	5	8.00	20.89	0.12	167.17	9.28	2
XXGETID	Subprogram	36	6	38	19	7.58	161.42	0.13	1224.11	68.00	2
XXTIDYUP	Program	6	2	15	7	2.00	42.11	0.50	84.22	4.67	2

Figure 2-7 GenMetrics window

MENU ITEMS	OPTIONS	DESCRIPTION
File	**Exit**	Exits the GenMetrics window.
Edit	**Settings**	Settings, provides the user with a method of changing what is viewed.
Tools	**List**	Displays the statistics in a list form (GenList).
	Graph	Displays the statistics in a graphical form (GenGraph).
Help		Invokes the GenMetrics help.
About		Displays the GenMetrics version information.

GenMetrics relies on a work file to build up the information to display in the window. The work file path needs to be defined in the NATENG.INI file.

The metrics are calculated internally as part of the post process of Natural Engineer. This is controlled by the metrics setting in the LOAD section of the NATENG.INI file.

Note: For more information on the NATENG.INI file parameter GENMETRICS refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Settings

Using the Edit➔Settings option allows you to customize the appearance and content of the GenMetrics window.

When invoked, the Settings window will be displayed offering three areas for customization:

1. Global
2. GenList
3. GenGraph.

Global

Global settings allow you to change the colors of each object type displayed in the GenGraph window.

The following Figure 2-8 illustrates the Global Settings option.

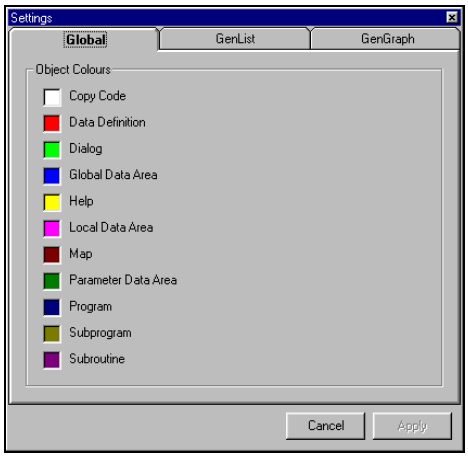


Figure 2-8 Global Settings

TAB ITEMS	DESCRIPTION
Object Colours	Each object color can be changed by using a double mouse click on each color box. This action will invoke the Color Palette window.

GenList

GenList settings allow you to change the data to be displayed in the GenMetrics window.

The following Figure 2-9 illustrates the GenList Settings option.

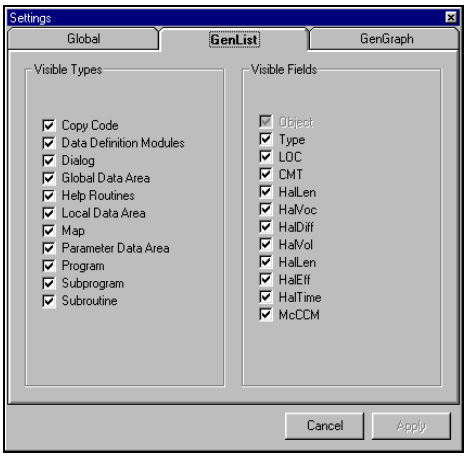


Figure 2-9 GenList Settings

TAB ITEMS	DESCRIPTION
Visible Types	Each type can be selected or deselected by using a mouse click on each check box.
Visible Fields	Each field can be selected or deselected by using a mouse click on each check box.

GenGraph

GenGraph settings allow you to change the data to be displayed in the GenGraph window.

The following Figure 2-10 illustrates the GenGraph Settings option.

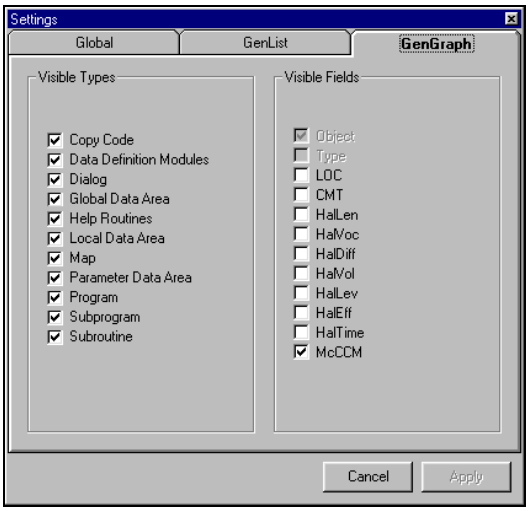


Figure 2-10 GenGraph Settings

TAB ITEMS	DESCRIPTION
Visible Types	Each type can be selected or deselected by using a mouse click on each check box.
Visible Fields	Each field can be selected or deselected by using a mouse click on each check box.

Tools

Using the Tools menu allows you to select a display mode for the GenMetrics information. There are two options:

1. List
2. Graph.

List

This will use the GenList mode to display the GenMetrics information. This is illustrated in Figure 2.7 above.

Graph

This will use the GenGraph mode to display the GenMetrics information. The following Figure 2-11 illustrates the GenGraph display mode.

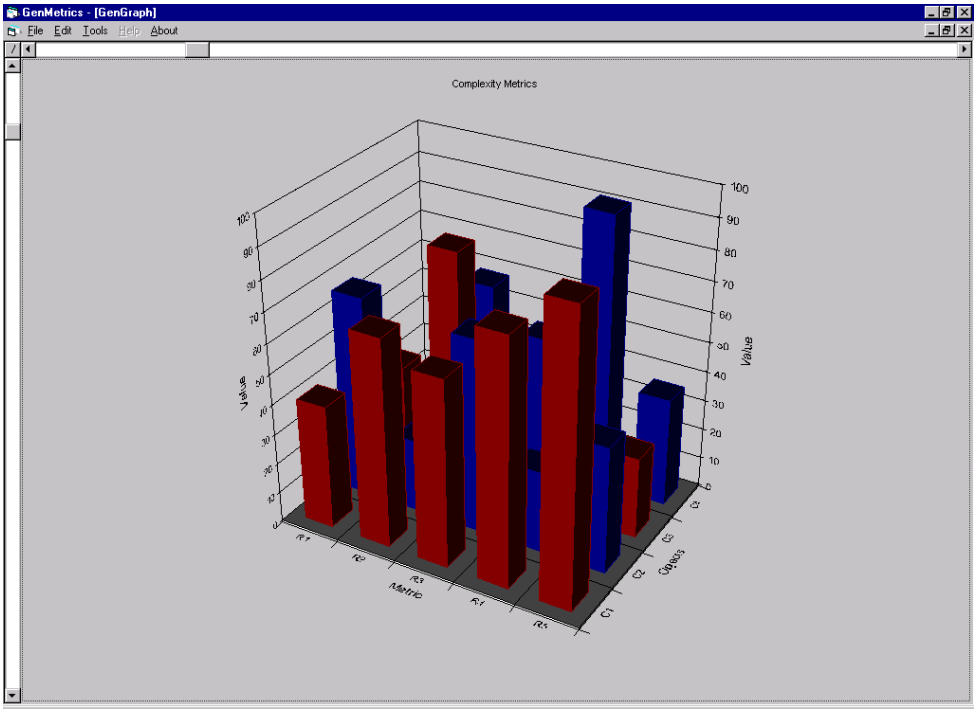


Figure 2-11 GenGraph display mode

Environment: Application Metrics Graphics

Application Metrics Graphics provide various measurement information on the objects within an application.

They are accessed by using the following menu navigation Environment➔Application Metrics➔Graphics.

Note: The Application Metrics Reports report options are described in Chapter 3: Textual Reporting Options.

Object Type Summary

This report uses a third party spreadsheet graph to display the number of objects per object type. The following Figure 2-12 illustrates the Object Type Summary graph.

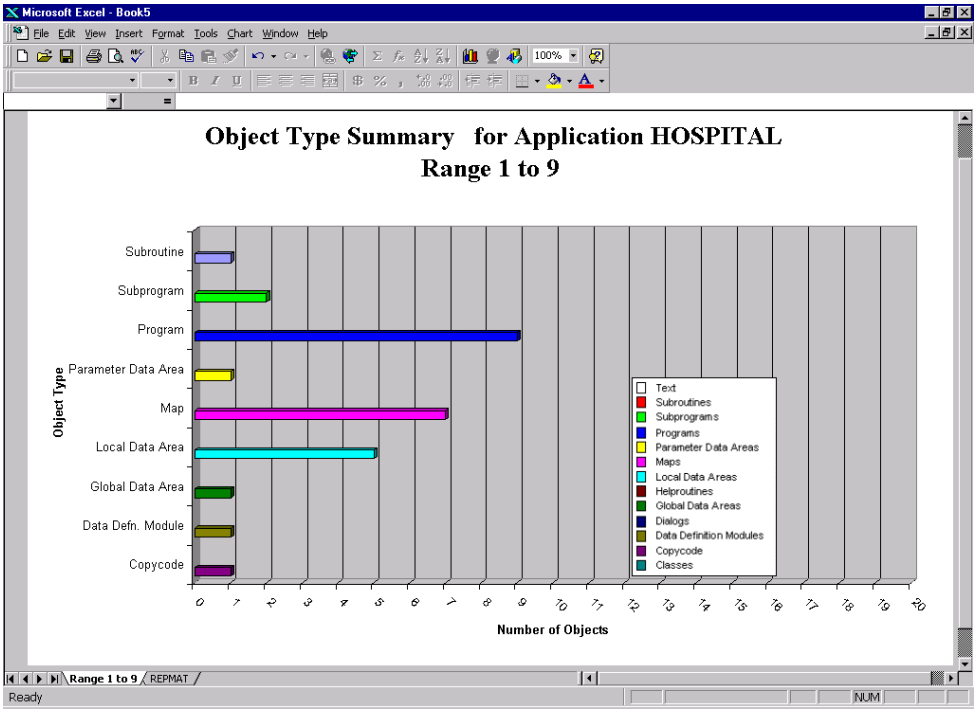


Figure 2-12 Object Type Summary graph

REPORT ITEM	DESCRIPTION
Application	The name of the application.
Range	The number of object types displayed on the current page
Object Type	The object types that are used in the application.
Number of Objects	The number of objects per object type.
Legend	The color representation per object type

Object Size

This report uses a third party spreadsheet graph to display the number of objects within specified object size ranges. The following Figure 2-13 illustrates the Object Size graph.

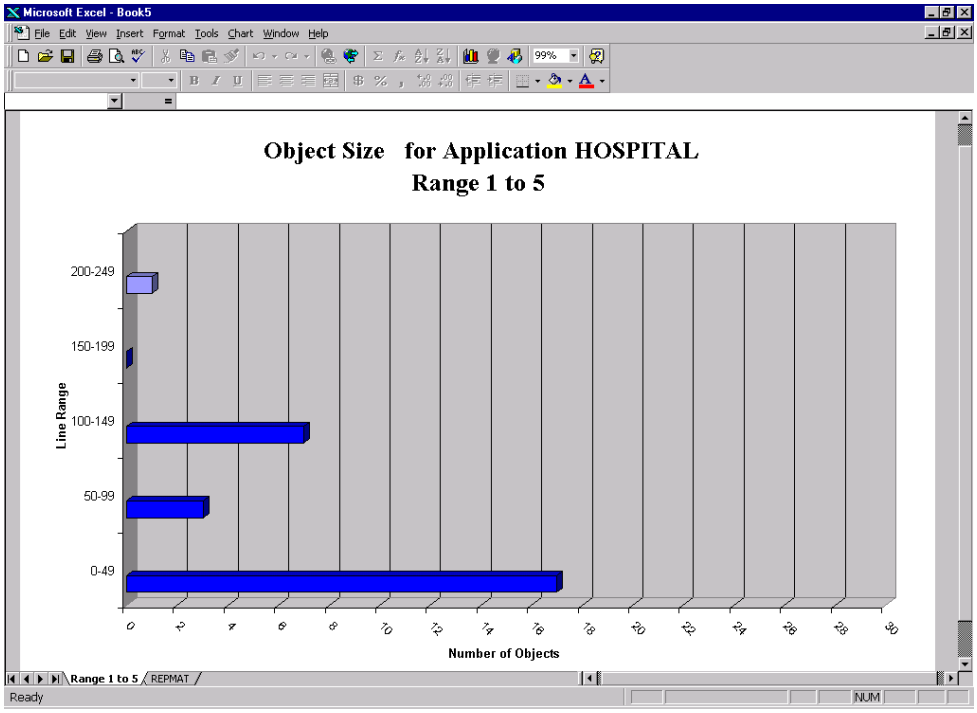


Figure 2-13 Object Size graph

REPORT ITEM	DESCRIPTION
Application	The name of the application.
Range	The number of Line Range values displayed on the current page
Line Range	The number of lines in a range. For Example: 100-149 means that the number of lines in an object falls within that range.
Number of Objects	The number of objects that have a number of lines of code within that range of lines.

Object Usage

This report uses a third party spreadsheet graph to display the number of times objects are referenced. The following Figure 2-14 illustrates the Object Usage graph.

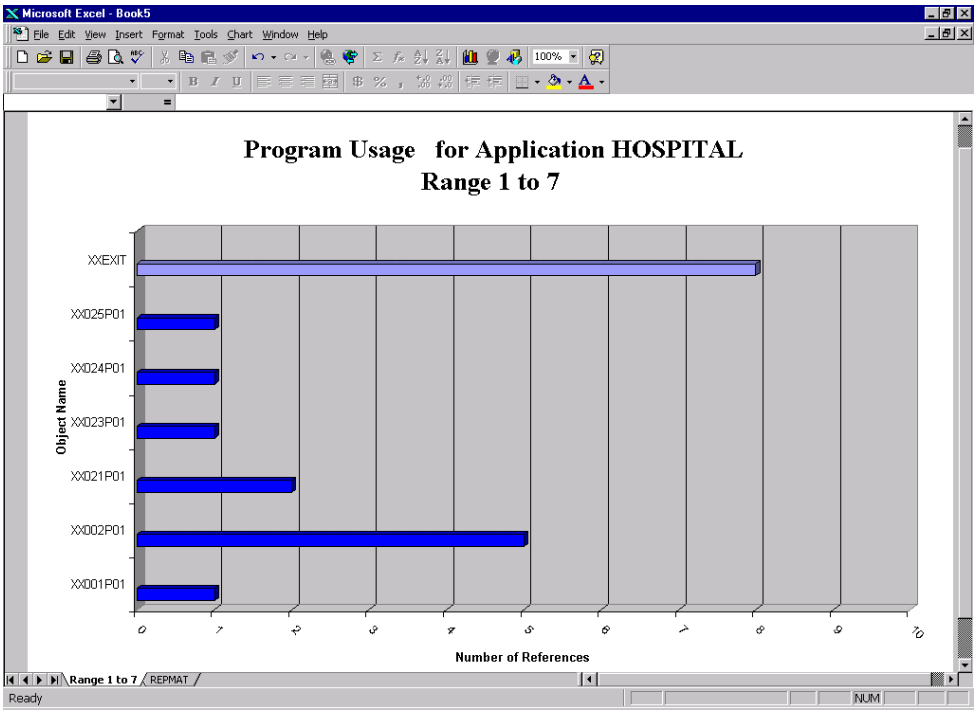


Figure 2-14 Object Usage graph

REPORT ITEM	DESCRIPTION
Application	The name of the application.
Range	The number of objects displayed on the current page. The report shows a maximum of 15 objects at a time.
Object Name	The names of the objects.
Number of References	The number of times that object is referenced in the application.

3

TEXTUAL REPORTING OPTIONS

Chapter Overview

This chapter reviews all the textual reports available to Natural Engineer.

Each report is described showing an image of a sample of that report along with an explanation as to the contents of that report.

The report samples shown for each report are based on the Reporter option when selecting a display mode for the report.

Note: More information on how to select different display modes can be found in Chapter 1: Reporting Display Modes.

The following report sections are covered:

- Global Reports
- Environment: Soft Links
- Environment: Application Metrics Reports
- Environment: Quality Logs
- Environment: Application Reports
- Analysis: Impact Reports
- Modification Reports

Global Reports

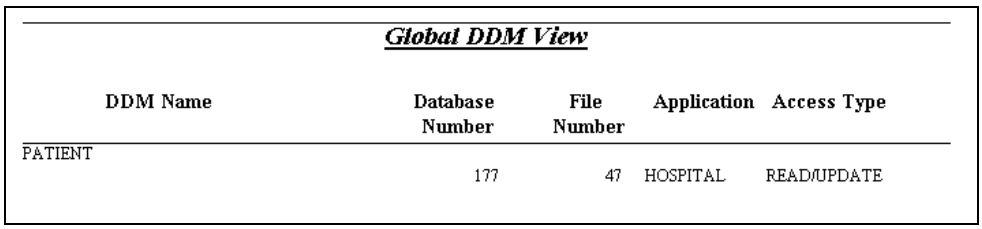
Global Reports show information that is across an individual Application. The reports show both Environment and Impact type information.

They are accessed by using the following menu navigation Options➔Global Reports.

Global DDM View

The Global DDM View reports on which applications use which DDMs contained in the Repository. This information is built as applications are processed and can be used as a quick reference to determine database impacts on applications.

The following Figure 3-1 illustrates the Global DDM View Report.



Global DDM View

DDM Name	Database Number	File Number	Application	Access Type
PATIENT	177	47	HOSPITAL	READ/UPDATE

Figure 3-1 Global DDM View Report

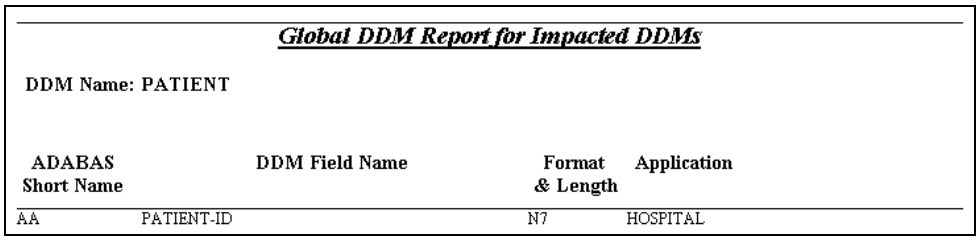
REPORT ITEM	DESCRIPTION
DDM Name	The name of the DDM used to access the database.
Database Number	The Database Number associated with the DDM.
File Number	The File Number of the DDM.

REPORT ITEM	DESCRIPTION
Application	The name of the application which references the DDM.
Access Type	The type of Natural statement used to access the DDM, i.e., FIND, STORE

Global DDM Report for Impacted DDMs

The Global DDM Report for Impacted DDMs show for each DDM which DDM fields are impacted in which application in the Repository.

The following Figure 3-2 illustrates the Global DDM Report for Impacted DDMs.



Global DDM Report for Impacted DDMs

DDM Name: PATIENT

ADABAS Short Name	DDM Field Name	Format & Length	Application
AA	PATIENT-ID	N7	HOSPITAL

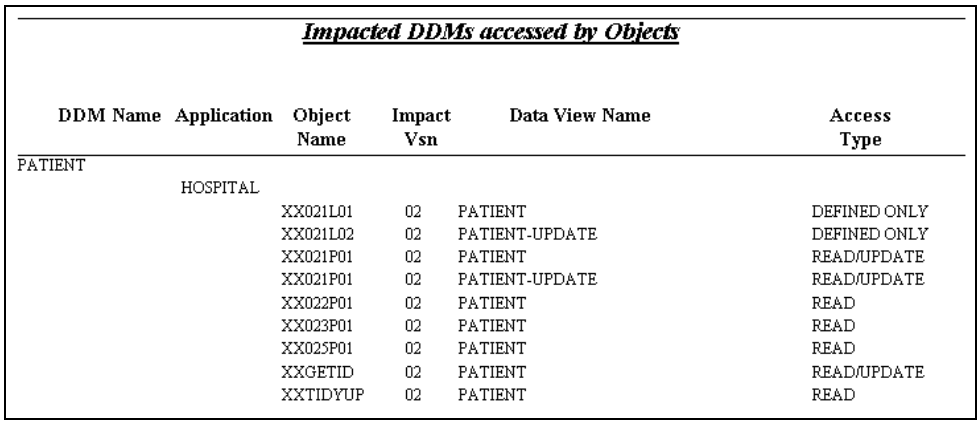
Figure 3-2 Global DDM Report for Impacted DDMs

REPORT ITEM	DESCRIPTION
DDM Name	The name of the DDM used to access the database.
Adabas Short Name	The Adabas Short Name for the DDM field.
DDM Field Name	The Impacted DDM Field Name.
Format & Length	The Data Definition of the DDM Field Name.
Application	The Application that the DDM Field is impacted in.

Impacted DDMs accessed by Objects

This shows what type of access in each application is used against the DDM. The report will help find all the affected DDM links between applications, and will identify the exact link point in each application.

The following Figure 3-3 illustrates the Impacted DDMs accessed by Objects.



Impacted DDMs accessed by Objects

DDM Name	Application	Object Name	Impact Vsn	Data View Name	Access Type
PATIENT					
	HOSPITAL				
		XX021L01	02	PATIENT	DEFINED ONLY
		XX021L02	02	PATIENT-UPDATE	DEFINED ONLY
		XX021P01	02	PATIENT	READ/UPDATE
		XX021P01	02	PATIENT-UPDATE	READ/UPDATE
		XX022P01	02	PATIENT	READ
		XX023P01	02	PATIENT	READ
		XX025P01	02	PATIENT	READ
		XXGETID	02	PATIENT	READ/UPDATE
		XXTIDYUP	02	PATIENT	READ

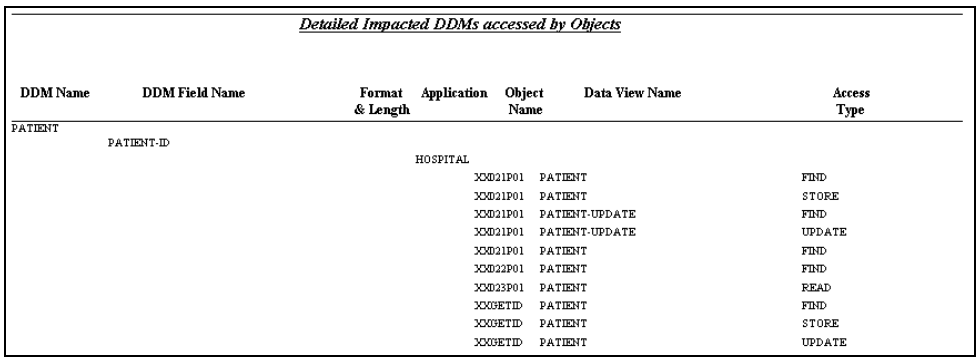
Figure 3-3 Impacted DDMs accessed by Objects

REPORT ITEM	DESCRIPTION
DDM Name	The name of the DDM used to access the database.
Application	The name of the application which references the DDM.
Object Name	The name of the Object.
Impact Vsn	The version number of the impact execution for the application.
Data View Name	The name of the view used to access the database.
Access Type	The type of Natural statement used to access the DDM, i.e., FIND, and STORE.

Detailed Impacted DDMs accessed by Objects

This is the same as the report above but is detailed at the field level. This report will help to decide on the selective Modification of fields and not necessarily all the DDM fields at once.

The following Figure 3-4 illustrates the Detailed Impacted DDMs accessed by Objects.



Detailed Impacted DDMs accessed by Objects

DDM Name	DDM Field Name	Format & Length	Application	Object Name	Data View Name	Access Type
PATIENT						
	PATIENT-ID					
			HOSPITAL			
				XXD21P01	PATIENT	FIND
				XXD21P01	PATIENT	STORE
				XXD21P01	PATIENT-UPDATE	FIND
				XXD21P01	PATIENT-UPDATE	UPDATE
				XXD21P01	PATIENT	FIND
				XXD22P01	PATIENT	FIND
				XXD23P01	PATIENT	READ
				XXGETID	PATIENT	FIND
				XXGETID	PATIENT	STORE
				XXGETID	PATIENT	UPDATE

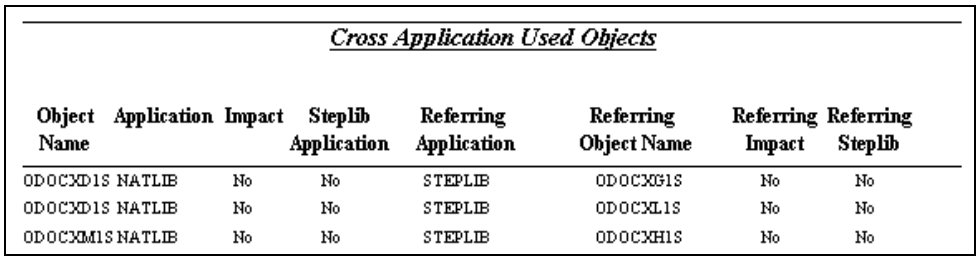
Figure 3-4 Detailed Impacted DDMs access by Objects

REPORT ITEM	DESCRIPTION
DDM Name	The name of the DDM used to access the database.
DDM Field Name	The name of the field in the DDM.
Format and Length	The format and length of the field.
Application	The name of the application which references the DDM.
Object Name	The name of the Object.
Data View Name	The name of the view used to access the database.
Access Type	The type of Natural statement used to access the DDM, i.e., FIND, and STORE.

Cross Application Used Objects

This report will help define all the procedural links between applications. It lists all the objects that exist in one application and referred to at other applications (reported as missing in those). This report includes all shared objects, affected and non-affected, since some may be affected by one of the referring applications and thus not recognized in the impact Analysis phase.

The following Figure 3-5 illustrates the Cross Application Used Objects



Cross Application Used Objects

Object Name	Application	Impact	Steplib Application	Referring Application	Referring Object Name	Referring Impact	Referring Steplib
ODOCXD1S	NATLIB	No	No	STEPLIB	ODOCXG1S	No	No
ODOCXD1S	NATLIB	No	No	STEPLIB	ODOCXL1S	No	No
ODOCXM1S	NATLIB	No	No	STEPLIB	ODOCXH1S	No	No

Figure 3-5 Cross Application Used Objects

REPORT ITEM	DESCRIPTION
Object Name	The name of the Object.
Application	The name of the application which references the DDM.
Impact	Identifies if the object is impacted.
Steplib Application	Identifies if the object is in a steplib application or the steplib application.
Referring Application	The name of the application that is either the steplib or using application.
Referring Object Name	The name of the object that is steplibbed or from the steplib application.
Referring Impact	Identifies if the referring object has been impacted.
Referring Steplib	Identifies if the referring object is in a steplib application or the steplib application.

Environment: Soft Links

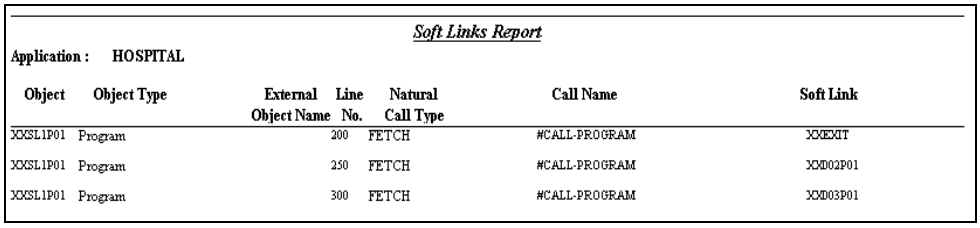
Soft Links reports show object link information. A Soft Link is one where a link between two objects has been defined using an alphanumeric variable rather than a literal constant.

They are accessed by using the following menu navigation Environment➔Soft Links. This will show the Objects Soft Link Maintenance screen, from here the menu option Reports➔Soft Links Report is used.

Soft Links Report

This report contains all Soft Links that a user has defined for objects.

The following Figure 3-6 illustrates the Soft Links Report.



Soft Links Report

Application : HOSPITAL

Object	Object Type	External Object Name	Line No.	Natural Call Type	Call Name	Soft Link
XXSL1P01	Program		200	FETCH	#CALL-PROGRAM	XXEXIT
XXSL1P01	Program		250	FETCH	#CALL-PROGRAM	XXD02P01
XXSL1P01	Program		300	FETCH	#CALL-PROGRAM	XXD03P01

Figure 3-6 Soft Links Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object	The name of the object.
Object Type	The type of Natural object, e.g., Map, Program, Local Data Area.
External Object Name	If the object exists in another physical object, such as a copycode, then the name of that object is shown.
Line No.	The Natural line numbers where call occurred.
Natural Call Type	The type of Natural calls. For Example: CALLNAT.
Call Name	The name of the Soft Link field called.
Soft Link	The user defined object name of the Soft Link.

Environment: Application Metrics Reports

Application Metrics reports provides various measurement information on the objects within an application.

They are accessed by using the following menu navigation Environment➔Application Metrics➔Reports.

Note: The Application Metrics Graphics report options are described in Chapter 2: Graphical Reporting Options.

Object Statistics

This option provides summary and detailed information about the application, objects, and code, for the purpose of providing structural statistics e.g., Halstead and McCabe.

This option will also produce a graphical report using GenMetrics.

Note: Refer to Chapter 2: Graphical Reporting Options, section GenMetrics window for more information on the graphical reporting options.

The following Figure 3-7 illustrates the Object Statistics Report.

Statistical Analysis

Application: HOSPITAL

Object Name	Object Type	Lines of Code	Comment Count	HalLen	HalVoc	HalDiff	HalVol	HalLev	HalEff	HalTime	McCabe
XXD01M01	Map	50	9	6	3	1	10	1	12	1	1
XXD01P01	Program	23	7	36	13	23	133	00	2997	167	6
XXD02M01	Map	53	9	5	3	1	8	1	8	0	1
XXD02P01	Program	31	7	54	14	38	206	00	7710	428	7
XXD21M01	Map	98	14	41	21	2	180	1	313	17	1
XXD21P01	Program	190	46	445	90	56	2889	00	161571	8976	42
XXD22M01	Map	95	14	39	19	2	166	1	302	17	1
XXD22P01	Program	36	12	60	38	10	315	0	3125	174	5
XXD23M01	Map	91	12	33	6	3	85	0	264	15	1
XXD23P01	Program	78	23	137	46	30	757	00	22898	1272	14
XXD24M01	Map	54	9	6	4	1	12	1	10	1	1
XXD24P01	Program	39	8	64	16	39	256	00	9856	548	8
XXD25M01	Map	89	12	32	5	4	74	0	279	15	1
XXD25P01	Program	93	24	159	49	32	893	00	28270	1571	16
XXCONUPD	Subprogram	12	3	14	8	9	42	0	378	21	2
XXEXIT	Subroutine	13	8	9	5	8	21	0	167	9	2

Figure 3-7 Object Statistics Report

REPORT ITEM	DESCRIPTION
Application	The name of the application.
Object Name	The name of the object.
Object Type	Type of the object.
Lines of Code	Total number of lines of code in the object.
Comment Count	The number of comments in the code.
HalLen	Halstead program length metric.
HalVoc	Halstead program vocabulary metric.
HalDiff	Halstead program difficulty metric.
HalVol	Halstead program volume metric.
HalLev	Halstead program level metric.
HalEff	Halstead programming effort metric.
HalTime	Halstead programming time metric.
McCabe	McCabe number metric.

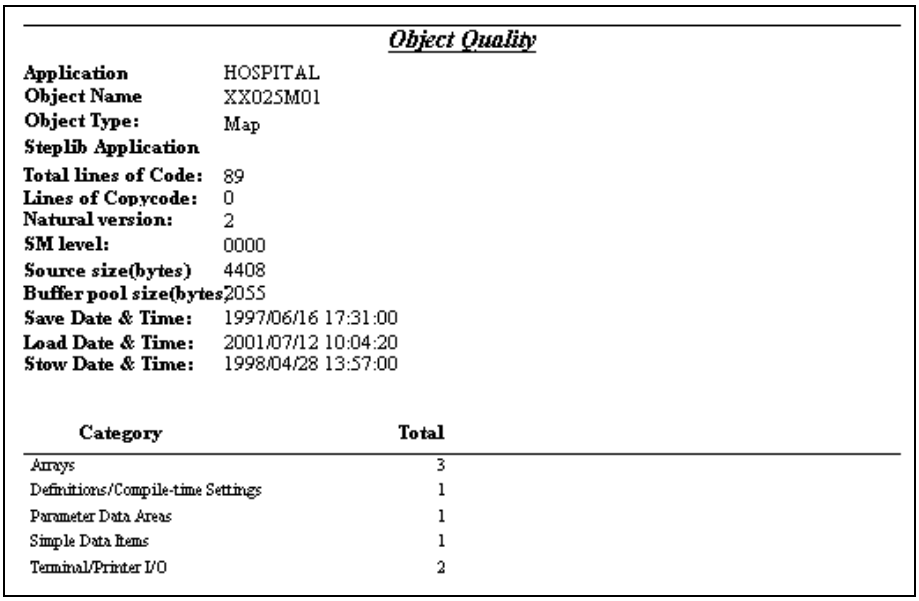
The metrics are calculated internally as part of the post process of Natural Engineer. This is controlled by the metrics setting in the LOAD section of the NATENG.INI file.

Note: For more information on the NATENG.INI file and the LOAD section refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Object Quality

This report provides information on the quality of an object.

The following Figure 3-8 illustrates the Object Quality Report.



Object Quality

Application	HOSPITAL
Object Name	XX02SM01
Object Type:	Map
Steplib Application	
Total lines of Code:	89
Lines of Copycode:	0
Natural version:	2
SM level:	0000
Source size(bytes)	4408
Buffer pool size(bytes	2055
Save Date & Time:	1997/06/16 17:31:00
Load Date & Time:	2001/07/12 10:04:20
Stow Date & Time:	1998/04/28 13:57:00

Category	Total
Arrays	3
Definitions/Compile-time Settings	1
Parameter Data Areas	1
Simple Data Items	1
Terminal/Printer I/O	2

Figure 3-8 Object Quality Report

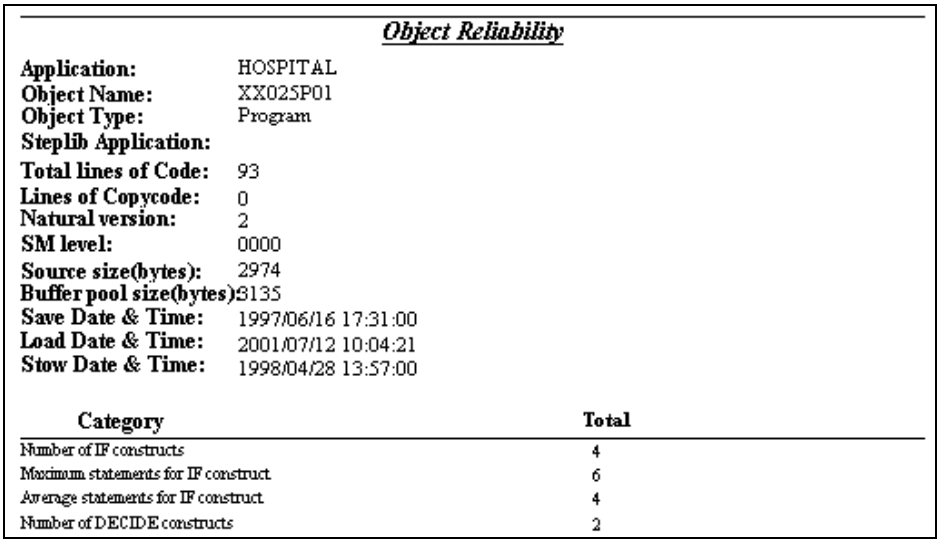
REPORT ITEM	DESCRIPTION
Application	Name of the application.
Object Name	Name of the object.
Object Type	Type of object.
Steplib Application	If the object has been extracted from a Steplib Application, the name of that application.
Total Lines of Code	Total number of lines of code in the object.
Lines of Copycode	Number of lines of copycode.
Natural version	Version of Natural used to code the object.

REPORT ITEM	DESCRIPTION
SM level	System Maintenance level of the version of Natural used to code the object.
Source Size (bytes)	Size of the source, in bytes, of the object.
Buffer pool size (bytes)	Size of the buffer pool, in bytes, for the object.
Save Date & Time	Date and time the source code was saved, in format yyyy/mm/dd hh:mm:ss.
Load Date & Time	Date and time the object was loaded into Natural Engineer, in format yyyy/mm/dd hh:mm:ss.
Stow Date & Time	Date and time the object was stowed, in format yyyy/mm/dd hh:mm:ss.
Category	Quality category as specified by Natural Engineer.
Count	The number of occurrences of the associated quality category.

Object Reliability

This report provides information on the reliability of an object.

The following Figure 3-9 illustrates the Object Reliability Report.



Object Reliability

Application:	HOSPITAL
Object Name:	XX025P01
Object Type:	Program
Steplib Application:	
Total lines of Code:	93
Lines of Copycode:	0
Natural version:	2
SM level:	0000
Source size(bytes):	2974
Buffer pool size(bytes):	3135
Save Date & Time:	1997/06/16 17:31:00
Load Date & Time:	2001/07/12 10:04:21
Stow Date & Time:	1998/04/28 13:57:00

Category	Total
Number of IF constructs	4
Maximum statements for IF construct	6
Average statements for IF construct	4
Number of DECIDE constructs	2

Figure 3-9 Object Reliability Report

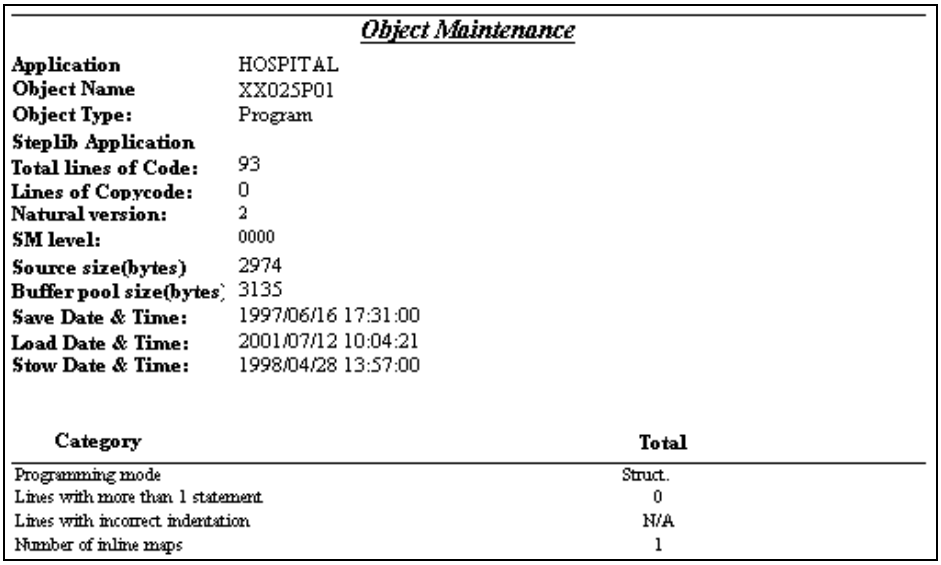
REPORT ITEM	DESCRIPTION
Application	Name of the application.
Object Name	Name of the object.
Object Type	Type of object.
Steplib Application	If the object has been extracted from a Steplib Application, the name of that application.
Total Lines of Code	Total number of lines of code in the object.
Lines of Copycode	Number of lines of copycode.
Natural version	Version of Natural used to code the object.
SM level	System Maintenance level of the version of Natural used to code the object.

REPORT ITEM	DESCRIPTION
Source Size (bytes)	Size of the source, in bytes, of the object.
Buffer pool size (bytes)	Size of the buffer pool, in bytes, for the object.
Save Date & Time	Date and time the source code was saved, in format yyyy/mm/dd hh:mm:ss.
Load Date & Time	Date and time the object was loaded into Natural Engineer, in format yyyy/mm/dd hh:mm:ss.
Stow Date & Time	Date and time the object was stowed, in format yyyy/mm/dd hh:mm:ss.
Category	Reliability Category as specified by Natural Engineer.
Total	The number of occurrences of the associated Reliability Category.

Object Maintenance

This report provides information on the maintainability of an object.

The following Figure 3-10 illustrates the Object Maintenance Report.



Object Maintenance

Application	HOSPITAL
Object Name	XX025P01
Object Type:	Program
Steplib Application	
Total lines of Code:	93
Lines of Copycode:	0
Natural version:	2
SM level:	0000
Source size(bytes)	2974
Buffer pool size(bytes)	3135
Save Date & Time:	1997/06/16 17:31:00
Load Date & Time:	2001/07/12 10:04:21
Stow Date & Time:	1998/04/28 13:57:00

Category	Total
Programming mode	Struct.
Lines with more than 1 statement	0
Lines with incorrect indentation	N/A
Number of inline maps	1

Figure 3-10 Object Maintenance Report

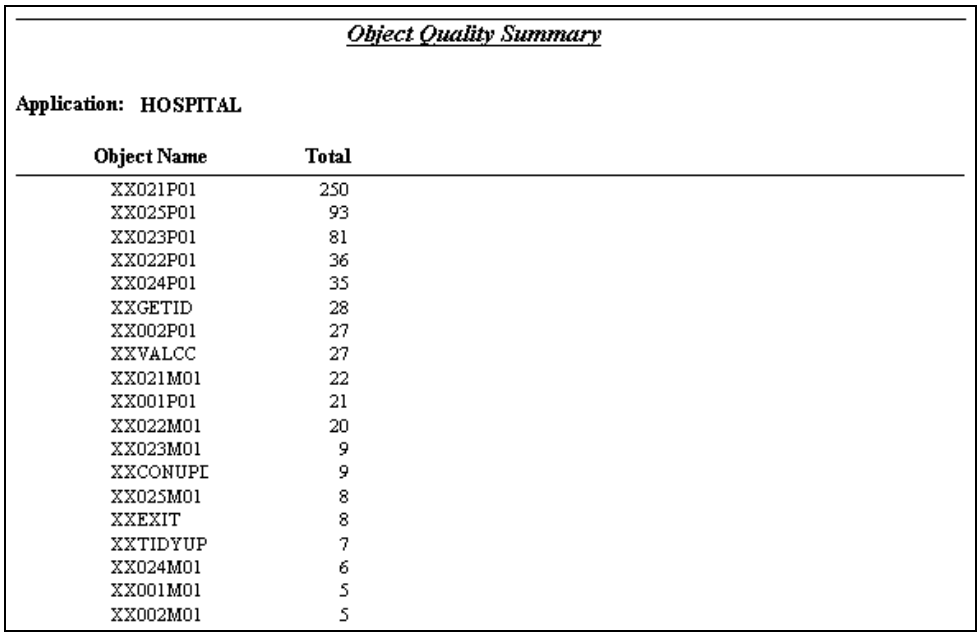
REPORT ITEM	DESCRIPTION
Application	Name of the application.
Object Name	Name of the object.
Object Type	Type of object.
Steplib Application	If the object has been extracted from a Steplib Application, the name of that application.
Total Lines of Code	Total number of lines of code in the object.
Lines of Copycode	Number of lines of copycode.
Natural version	Version of Natural used to code the object.

REPORT ITEM	DESCRIPTION
SM level	System Maintenance level of the version of Natural used to code the object.
Source Size (bytes)	Size of the source, in bytes, of the object.
Buffer pool size (bytes)	Size of the buffer pool, in bytes, for the object.
Save Date & Time	Date and time the source code was saved, in format yyyy/mm/dd hh:mm:ss.
Load Date & Time	Date and time the object was loaded into Natural Engineer, in format yyyy/mm/dd hh:mm:ss.
Stow Date & Time	Date and time the object was stowed, in format yyyy/mm/dd hh:mm:ss.
Category	Maintainability Category as specified by Natural Engineer.
Total	The number of occurrences of the associated Maintainability Category.

Object Quality Summary

This report shows a calculated value for an object's quality, against specified metrics.

The following Figure 3-11 illustrates the Object Quality Summary Report.



Object Quality Summary

Application: HOSPITAL

Object Name	Total
XX021P01	250
XX025P01	93
XX023P01	81
XX022P01	36
XX024P01	35
XXGETID	28
XX002P01	27
XXVALCC	27
XX021M01	22
XX001P01	21
XX022M01	20
XX023M01	9
XXCONUPI	9
XX025M01	8
XXEXIT	8
XXTIDYUP	7
XX024M01	6
XX001M01	5
XX002M01	5

Figure 3-11 Object Quality Summary Report

REPORT ITEM	DESCRIPTION
Application	Name of the application.
Object Name	Name of the object.
Count	The value given to the quality of the object.

Object Reliability Summary

This report shows a calculated value for an object's reliability, against specified metrics.

The following Figure 3-12 illustrates the Object Reliability Summary Report.

Object Reliability Summary

Application: HOSPITAL

Object Name	Count
XX021P01	348
XX025P01	165
XX023P01	162
XX022P01	94
XXVALCC	87
XX024P01	80
XX001P01	65
XX002P01	52
XX023M01	18
XX025M01	18
XXGETID	16
XXTIDYUP	14
XX021M01	13
XX022M01	13
XXCONUPD	11
XXEXIT	11
XX001M01	10
XX002M01	10
XX024M01	10

Figure 3-12 Object Reliability Summary Report

REPORT ITEM	DESCRIPTION
Application	Name of the application.
Object Name	Name of the object.
Count	The value given to the reliability of the object.

Environment: Quality Logs

Quality logs provide information on errors that occurred during both the Extract and Load Repository process and also report missing or unused Natural objects once the Repository has been loaded.

Extract Source Code

This report shows the details within the Extract Error file (data files with file extension .EEX) for the current application. This can be viewed in the window as shown below or using NOTEPAD by selecting the button on the window.

Note: These details can be seen in summary format by using the Environment➔Quality Logs➔Extract Source Code Summary option. See next report.

The following Figure 3-13 illustrates the Extract Source Code Quality Log.

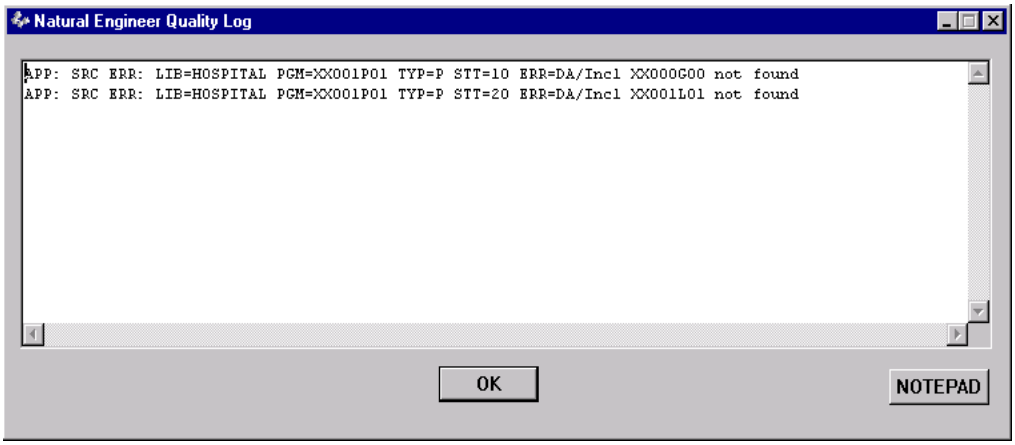


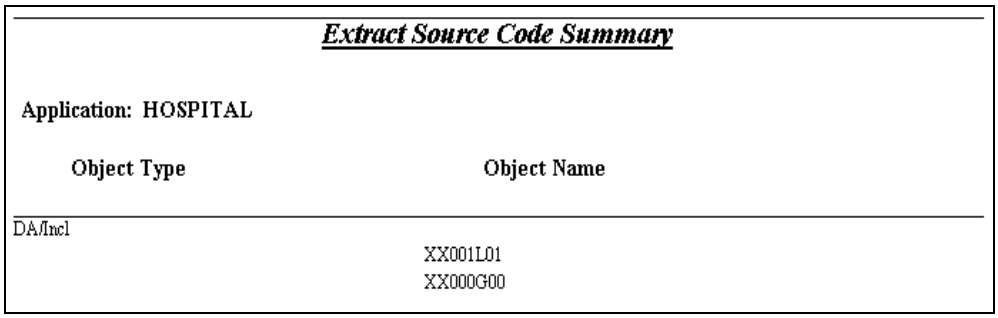
Figure 3-13 Extract Source Code Quality Log

REPORT ITEM	DESCRIPTION
LIB=	Identifies the name of the application being processed.
PGM=	The name of the Object being extracted.
TYP=	The type of Natural object, i.e., Map, Program Local Data Area.
STT=	The line number of the external object being referenced.
ERR=	Details the extract error.

Extract Source Code Summary

This report summarizes the errors in the Extract Error Log so that they are only shown once for each object. You can therefore see what objects are required to resolve the references.

The following Figure 3-14 illustrates the Extract Source Code Summary Report.



Extract Source Code Summary

Application: HOSPITAL

Object Type	Object Name
DA/Incl	
	XX001L01
	XX000G00

Figure 3-14 Extract Source Code Summary Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Object Type	The type of Natural object, i.e., Map, Program, Local Data Area.
Object Name	The name of the Object

Load Repository

This report shows the details within the Load Error file (data files with file extension .ELD) for the current application. This can be viewed in the window as shown below or using NOTEPAD by selecting the button on the window.

The following Figure 3-15 illustrates the Load Repository Quality Log.

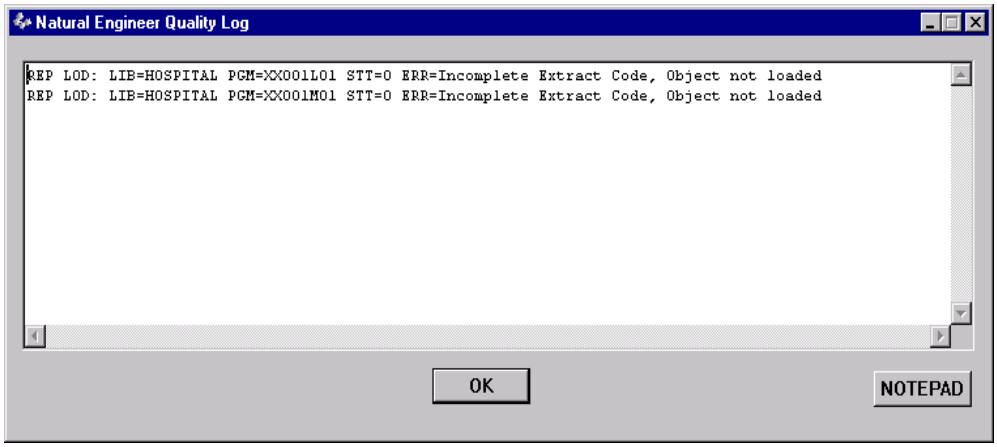


Figure 3-15 Load Repository Quality Log

REPORT ITEM	DESCRIPTION
LIB=	Identifies the name of the application being processed.
PGM=	The name of the Object being loaded.
STT=	The statement line number within the object (if applicable).
ERR=	Details the load error.

Missing Natural Objects

This report identifies Natural objects (including DDMs) that were referenced by an object but were not found in the application library. You can either:

- Remove the object referencing the missing object from the application library, delete it from the Repository and source code library.

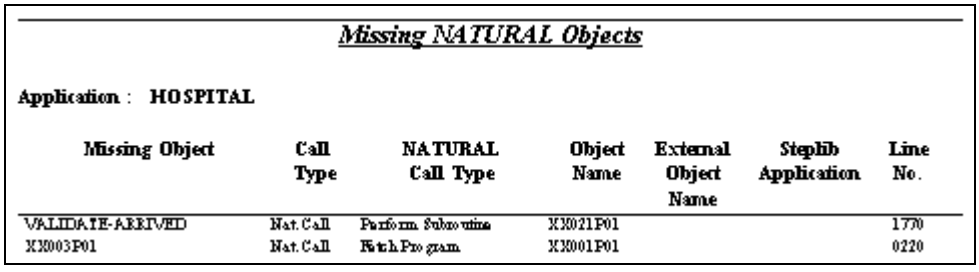
Or:

1. Locate the missing object and copy it to the application library.
2. Selectively extract both the objects that referenced the missing object and the missing object.
3. Load the objects using Load Repository.

Or:

1. Locate the missing object and copy it to the application library.
2. Extract the Missing Objects using the Extract Missing Objects Option.
3. Load the objects using Load Repository.

The following Figure 3-16 illustrates the Missing Natural Objects Report.



Missing NATURAL Objects

Application : HOSPITAL

Missing Object	Call Type	NATURAL Call Type	Object Name	External Object Name	Steplib Application	Line No.
VALIDATE-ARRIVED	Nat.Call	Perform Subroutine	XH021P01			1770
XH003P01	Nat.Call	Batch Program	XH001P01			0220

Figure 3-16 Missing Natural Objects Report

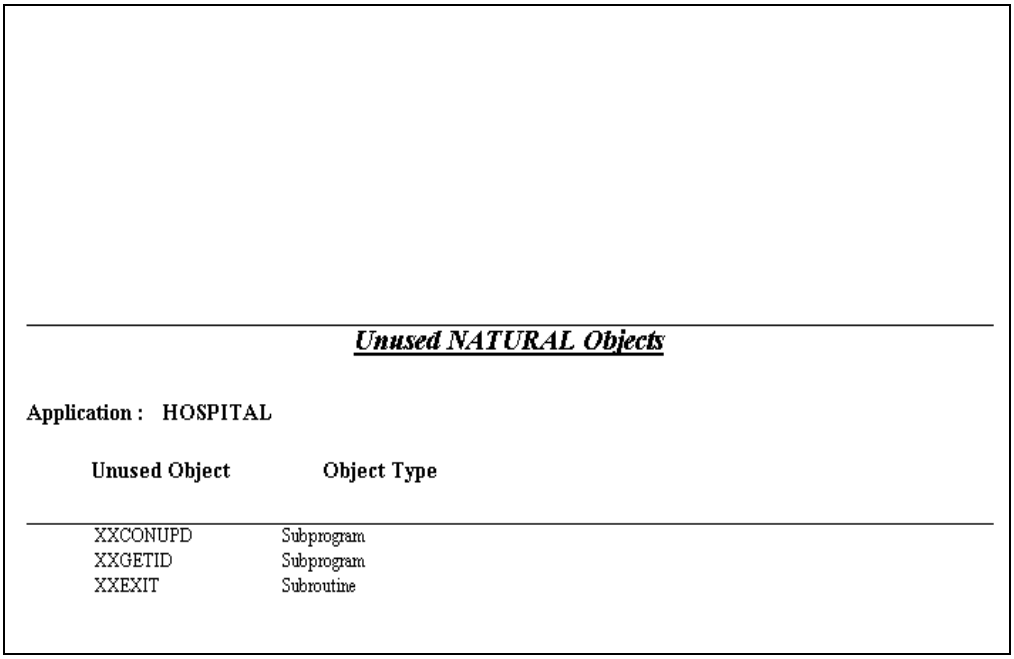
REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Missing Object	The name of the Object that cannot be found.
Call Type	Identifies the type of call being issued, i.e., Natural call type or not.
Natural Call Type	Identifies the type of Natural call i.e., Perform Subroutine.
Object Name	The name of the Object.
External Object Name	If the object exists in another physical object then the name of that object is linked.
Steplib Application	The name of the application that the object is extracted from.
Line No.	The Natural line number where the reference occurred.

If a missing object matches the list of Valid Missing Objects specified at the Extract stage then the Missing object will be marked in the report as ‘Customer Exclusion’.

Unused Natural Objects

This report identifies the objects within the application that do not have a reference to another object. Programs are excluded from this report. If an application uses 'soft linking' between objects then information in this report will be invalid.

The following Figure 3-17 illustrates the Unused Natural Objects Report.



Unused NATURAL Objects

Application : HOSPITAL

Unused Object	Object Type
XXCONUPD	Subprogram
XXGETID	Subprogram
XXEXIT	Subroutine

Figure 3-17 Unused Natural Objects Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Unused Object	The name of the object.
Object Type	The type of Natural object, i.e., Map, Sub-program Local Data Area.

Environment: Application Reports

The Application Reports provide various levels of Analysis information on the application after it is loaded in the Repository (i.e. before Impact Analysis).

You can view this information in any one of several reporting display modes:

- In graphical format using the interface to an OLE-compliant diagramming tool (For Example Microsoft Visio 2000®).
- In textual format on the Natural screen, using Natural Reporter or MS Excel spreadsheet package.

Note: For more information on the different Reporting Display Modes refer to Chapter 1 of this manual.

The Application Reports can be accessed using the following menu navigation: Environment➔ Application Reports.

The following table summarizes the Application Reports:

REPORT ID	REPORT NAME	DESCRIPTION
	Bulk Report Generator	This allows you to select reports to be executed at the same time. You can use this option to produce all reports for viewing later.
REPSCC	**Source Code Summary**	Provides a high-level view of the application by object type.
REPOIS	**Object Summary**	Provides a list of objects and their size in the application.
REPKWD	**Natural Keyword Summary**	Provides a list of statement types used in the application.
REPCAL	**Objects Referencing Objects**	Identifies the objects, internal and external, used by an object.
REPCA2	**Objects Referenced by Objects**	Identifies for an object all uses of it by all other objects.
REPODF	**Objects Referenced by DDM Fields**	Identifies for each DDM field the objects that use the field.
REPEXX	**External Objects**	Identifies all non-Natural objects referenced

REPORT ID	REPORT NAME	DESCRIPTION
	Referenced by Objects	within the application.
REPCMO	**Construct Models referenced by Objects**	Show models and user exits used within the application.
REPKEY	**Natural Keywords Referenced**	Identifies for each Natural keyword the objects that use them.
REPDDM	**DDMs Referenced**	Identifies all DDMs used in the application.
REPDVO	**DDMs Referenced by Objects**	Identifies, for DDMs, all objects that use them.
REPDAO	**DDMs Accessed by Objects**	Identifies the type of access of the DDMs by the objects using them (either directly or via Data Views).
REPDDR	**Database Data Requirements**	Identifies DDM and fields referenced by an Application.
REPDII	**Data Item Inventory**	Show all fields (data items), by object, used in the application.
REPFLD	**Data Item Usage Inventory**	Shows all impacted objects a data item is used in.
REPSRC	**View Source Code**	Displays object source code in the Browser.

The table shows the report ids for each report. These are used within the REPORTER section of the NATENG.INI file to set the default report display mode for each report.

Note: For more information on the NATENG.INI file section REPORTER refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Source Code Summary

Provides a high-level view of the application, by the types of Natural objects. This report shows the size of the application in terms of Lines of Code (LOC) and the number of objects within the Application.

The following Figure 3-18 illustrates the Source Code Summary Report.

Source Code Summary

Application HOSPITAL

Object Type	Total Objects	Total Lines	Average Lines	Largest Lines	Total RM Objects	Total SM Objects
Parameter Data Area	1	4	4	4	0	1
Copycode	1	88	88	88	0	1
Data Defn. Module	1	17	17	17	0	0
Global Data Area	1	4	4	4	0	1
Local Data Area	5	43	9	20	0	5
Map	7	530	76	98	0	7
Subprogram	2	48	24	36	0	2
Program	8	496	62	190	1	7
Subroutine	1	13	13	13	0	1
Totals:	**27**	**1,243**	**46**	**190**	**1**	**25**

(Comment lines not included)

Total Maps with Processing Rules: 2

NATURAL Library: HOSPITAL **Steplib Applications**: SYSTEM

Extract Start Date: 13-Jun-2001 10:40:32
Extract End Date: 13-Jun-2001 10:41:10
Extract Duration: 00:00:38

Load Start Date: 13-Jun-2001 10:41:31
Load End Date: 13-Jun-2001 10:41:47
Load Duration: 00:00:16

Figure 3-18 Source Code Summary Report

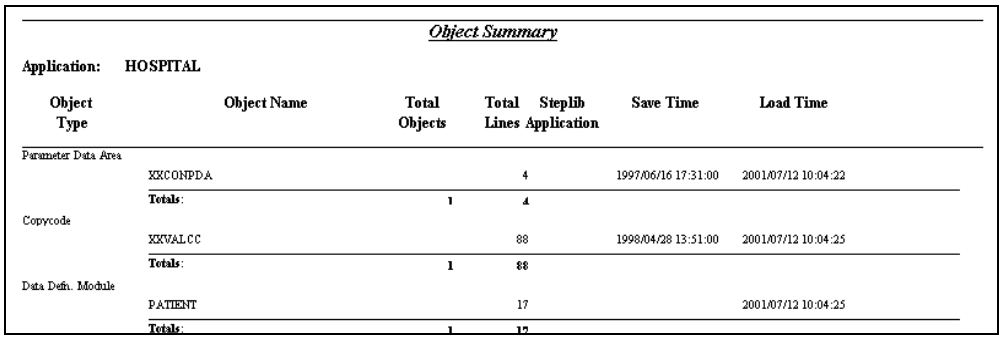
REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Type	The type of Natural object i.e. Map, Program, Local Data Area.
Total Objects	The number of objects in the application.
Total Lines	The number of syntax lines in the application.
Average Lines	'Total Lines' divided by 'Total Objects' for each object type.
Largest Lines	The largest number of syntax lines for an object type.
Total RM Objects	The number of Reporting mode objects for each object type
Total SM Objects	The number of Structured mode objects for each object type.
Total Maps with Processing Rules	Identifies the number of map objects that contain processing rules.
Natural library	The library where the Natural code was extracted from, only required if different from application name.
Steplib Applications	The list of Natural libraries that Natural Engineer will check for source code for the application.
Extract Start Date	The date and time that the Extract processes started.
Extract End Date	The date and time that the Extract processes ended.
Extract Duration	The time taken for the Extract process to be completed. The Start Date is subtracted from the End Date.
Load Start Date	The date and time that the Load processes started.
Load End Date	The date and time that the Load processes ended.
Load Duration	The time taken for the Load process to be completed. The Start Date is subtracted from the End Date.
Extract Environment	The environment that the Natural source code operates from. Documentation facility only.

Note: Comment lines are NOT included in the line counts.

Object Summary

This report shows a list of objects for the application in the Natural Engineer Repository.

The following Figure 3-19 illustrates the Object Summary Report.



Object Summary

Application: HOSPITAL

Object Type	Object Name	Total Objects	Total Lines	Steplib Application	Save Time	Load Time
Parameter Data Area						
	XXCONPDA		4		1997/06/16 17:31:00	2001/07/12 10:04:22
	Totals:	1	4			
Copycode						
	XXVALCC		88		1998/04/28 13:51:00	2001/07/12 10:04:25
	Totals:	1	88			
Data Defn. Module						
	PATIENT		17			2001/07/12 10:04:25
	Totals:	1	17			

Figure 3-19 Object Summary Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Type	The type of Natural object, e.g., Map, Program, Local Data Area.
Object Name	The name of the object.
Total Objects	The total number of objects for each object type.
Total Lines	The number of syntax lines in the application.
Steplib Application	The name of the application that the object was extracted from.
Save Time	Object save date and time in Natural.

REPORT ITEM	DESCRIPTION
Load Time	Date and time object was loaded into Natural Engineer.

Note: Comment lines are NOT included in line counts.

NATURAL Keywords Summary

Provides a list of statement types used for the application. This can be used to categorize the application in terms of statement for complexity; for example, update applications as opposed to read-only applications, or to identify applications using particular Natural syntax.

The following Figure 3-20 illustrates the Natural Keywords Summary Report.

NATURAL Keywords Summary

Application : HOSPITAL

Keyword	Number
ADD	5
CALLNAT	2
COMPRESS	3
DECIDE	12
DECIDE VALUE	30

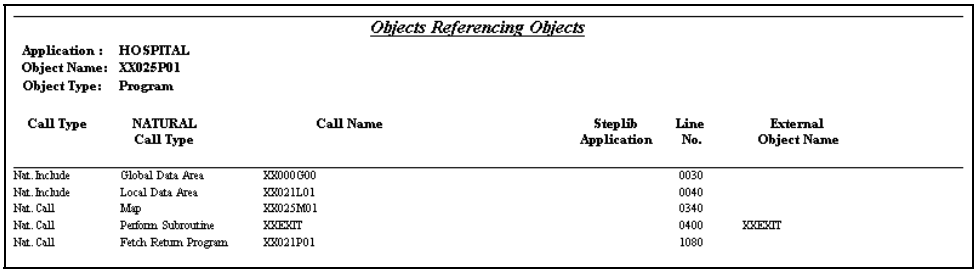
Figure 3-20 Natural Keywords Summary Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Keyword	The Natural keyword used.
Number	The number of occurrences of the keyword found in the application.

Objects Referencing Objects

Identifies the objects, internal and external, used by a specific object within the application. This report identifies all objects used to identify the other components of the application used by the object.

The following Figure 3-21 illustrates the Objects Referencing Objects Report.



Objects Referencing Objects

Application : HOSPITAL
Object Name: XX025P01
Object Type: Program

Call Type	NATURAL Call Type	Call Name	Steplib Application	Line No.	External Object Name
Nat. Include	Global Data Area	XX000G00		0030	
Nat. Include	Local Data Area	XX021L01		0040	
Nat. Call	Map	XX025M01		0340	
Nat. Call	Perform Subroutine	XXEXIT		0400	XXEXIT
Nat. Call	Fetch Return Program	XX021P01		1080	

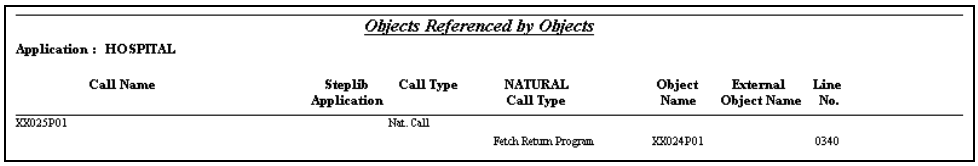
Figure 3-21 Objects Referencing Objects Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the object.
Object Type	The type of Natural object i.e., Map, Program, Local Data Area.
Call Type	The type of call being issued, i.e., Natural call type or not.
Natural Call Type	The type of Natural calls i.e., Perform Subroutine.
Call Name	The name of the object referenced by the call.
Steplib Application	The name of the application that the object was extracted from.
Line No.	The Natural line number for the statement.
External Object Name	If the call name is contained in another physical object, then the name of that object is listed. For example, the Perform statement can have a name up to 32 bytes long and the code can exist in an external object that has a name of only 8 bytes, i.e., a Natural programming object in its own right.

Objects Referenced by Objects

Identifies, for an object, all uses of it by all other objects, for both internal and external routines.

The following Figure 3-22 illustrates the Objects Referenced by Objects Report.



Objects Referenced by Objects

Application : HOSPITAL

Call Name	Steplib Application	Call Type	NATURAL Call Type	Object Name	External Object Name	Line No.
XX025P01		Nat. Call				
			Fetch Return Program	XX024P01		0340

Figure 3-22 Objects Referenced by Objects Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Call Name	The name of the object referenced by the call.
Steplib Application	The name of the application that the object was extracted from.
Call Type	Identifies the type of call being issued, i.e., Natural call type or not.
Natural Call Type	Identifies the type of Natural call i.e., Perform Subroutine.
Object Name	The name of the object.
External Object Name	If the call name is contained in another physical object, then the name of that object is listed. For example, the Perform statement can have a name up to 32 bytes long and the code can exist in an external object that has a name of only 8 bytes, i.e., a Natural programming object in its own right.
Line No.	The Natural line number where the reference occurred.

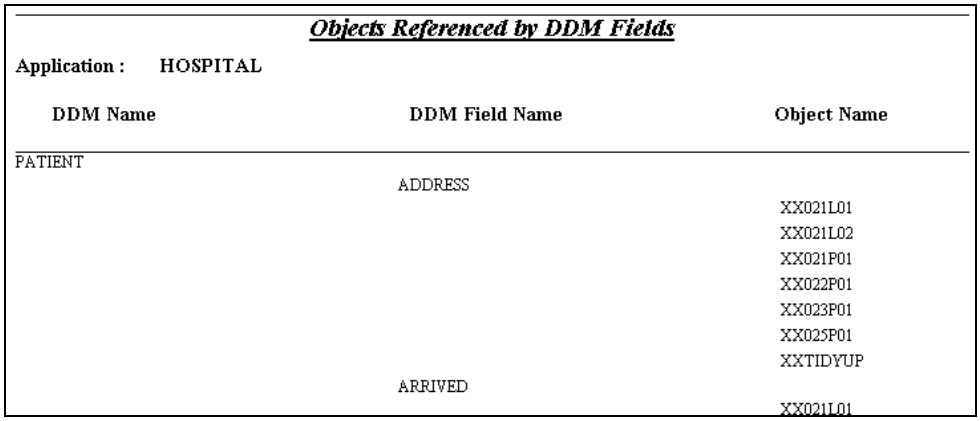
On the PC the object list selection screen is displayed prior to the execution of the report. This allows the user to selectively choose which CALL-NAME they want to inquire on. Where that call name is an Automatic Rules in maps or Subroutines, then the following Natural Engineer names are shown in the object list:

&AUTORUL for Automatic Rules in maps
&SUBR for Subroutines.

Objects Referenced by DDM

Identifies for each DDM field the objects that reference the field.

The following Figure 3-23 illustrates the Objects Referenced by DDM Report.



Objects Referenced by DDM Fields

Application : HOSPITAL

DDM Name	DDM Field Name	Object Name
PATIENT		
	ADDRESS	
		XX021L01
		XX021L02
		XX021P01
		XX022P01
		XX023P01
		XX025P01
		XXTIDYUP
	ARRIVED	
		XX021L01

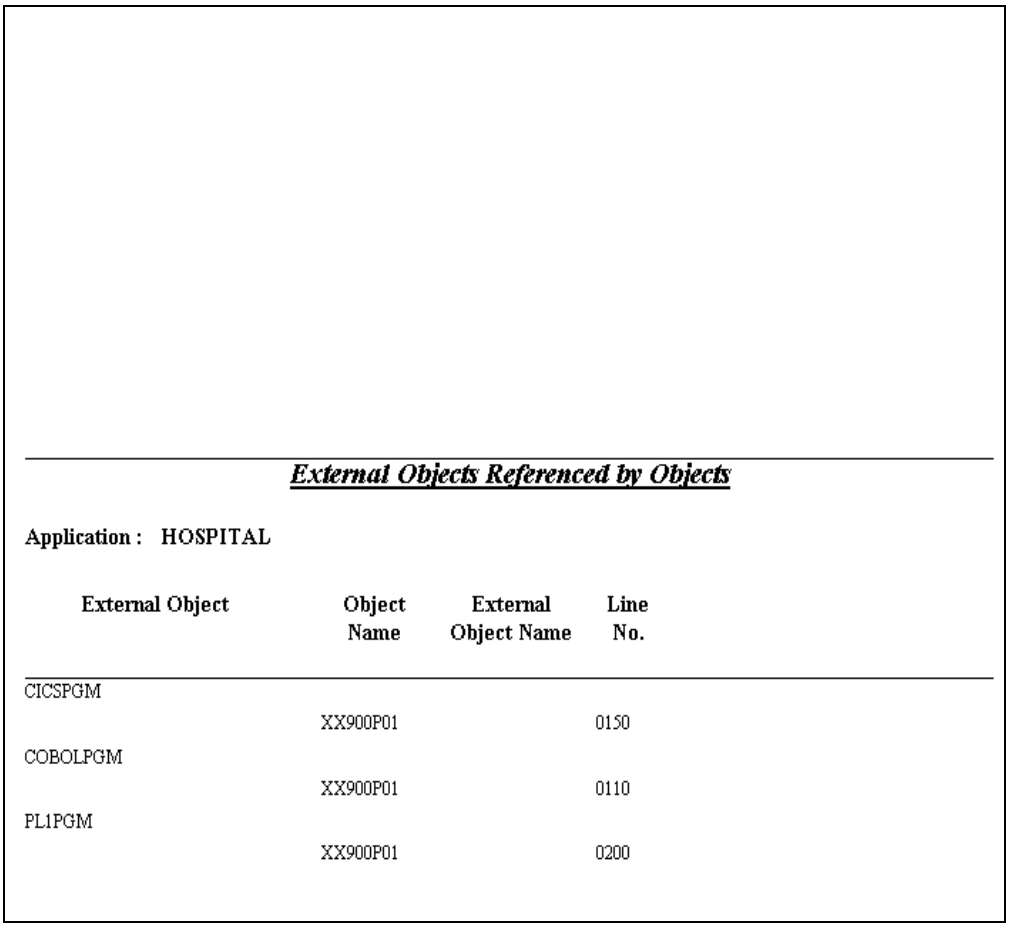
Figure 3-23 Objects Referenced by DDM Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
DDM Name	The name of the DDM used to access the database.
DDM Field Name	The name of the DDM field used.
Object Name	The name of the Natural object issuing the call.

External Objects Referenced by Objects

Identifies all references to non-Natural objects from the application. This report is therefore a complete list of the external routines used directly by the Natural application.

The following Figure 3-24 illustrates the External Objects Referenced by Objects Report.



External Objects Referenced by Objects

Application : HOSPITAL

External Object	Object Name	External Object Name	Line No.
CICSPGM			
	XX900P01		0150
COBOLPGM			
	XX900P01		0110
PL1PGM			
	XX900P01		0200

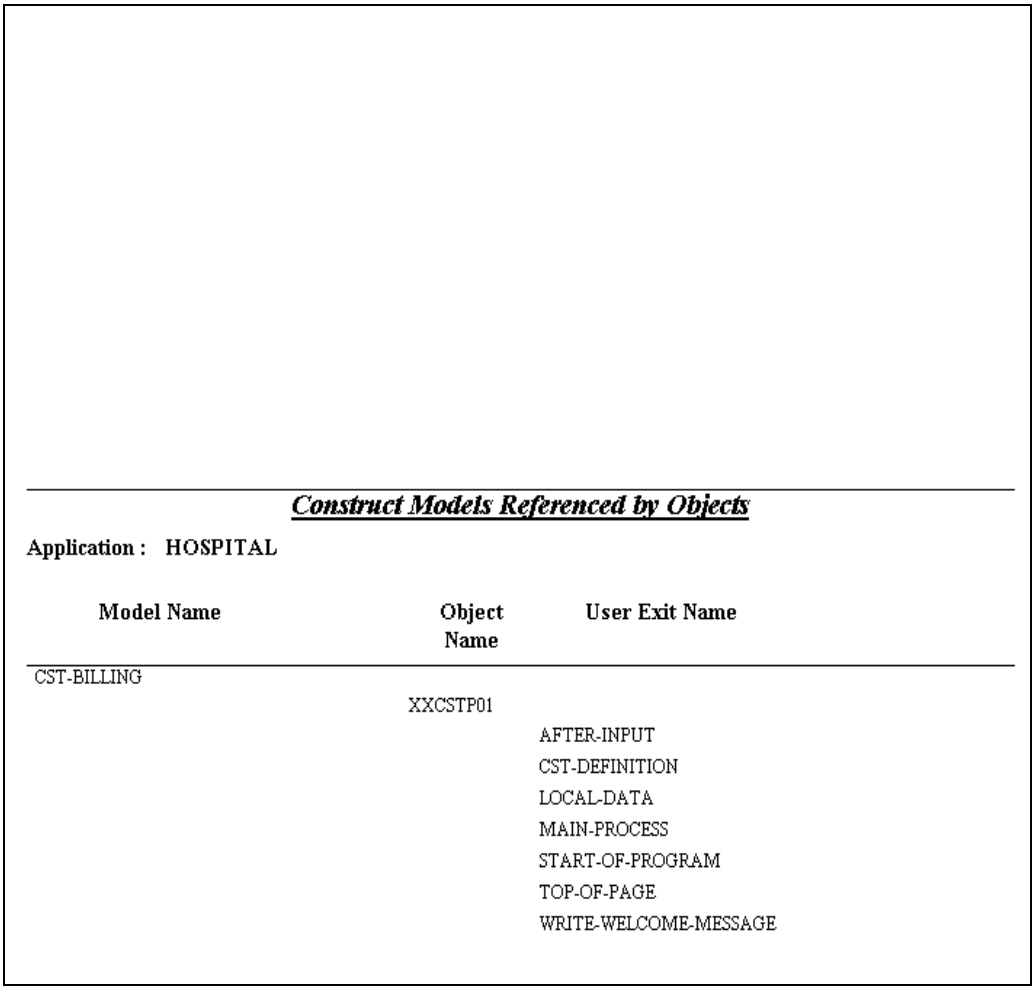
Figure 3-24 External Objects Referenced by Objects Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
External Object	The name of the external object referenced by the call.
Object Name	The name of the Natural object issuing the call.
External Object Name	If the call name is contained in another physical object, then the name of that object is listed. For example, the Perform statement can have a name up to 32 bytes long and the code can exist in an external object that has a name of only 8 bytes, i.e., a Natural programming object in its own right.
Line No.	The Natural line number where the reference occurred.

CONSTRUCT Models Referenced by Objects

This report shows a list of Construct models and user exits used by objects in the application.

The following Figure 3-25 illustrates the Construct Models Referenced by Objects Report.



Construct Models Referenced by Objects

Application : HOSPITAL

Model Name	Object Name	User Exit Name
CST-BILLING		
	XXCSTP01	
		AFTER-INPUT
		CST-DEFINITION
		LOCAL-DATA
		MAIN-PROCESS
		START-OF-PROGRAM
		TOP-OF-PAGE
		WRITE-WELCOME-MESSAGE

Figure 3-25 Construct Models Referenced by Objects Report

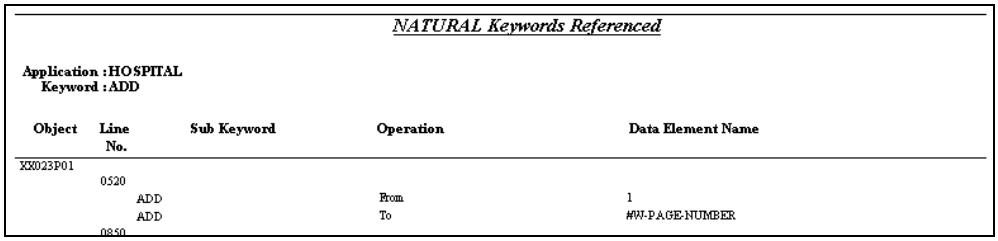
REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Model Name	The name of the Construct model used.
Object Name	The name of the object.
User Exit Name	The name of the User Exit used.

Textual Reporting Options 3

NATURAL Keywords Referenced

Identifies for a particular Natural Keyword the instance of that keyword in an application.

The following Figure 3-26 illustrates the Natural Keywords Referenced Report.



NATURAL Keywords Referenced

Application :HOSPITAL
Keyword :ADD

Object	Line No.	Sub Keyword	Operation	Data Element Name
XX023P01				
	0520			
		ADD	From	1
		ADD	To	#W-PAGE-NUMBER
	0850			

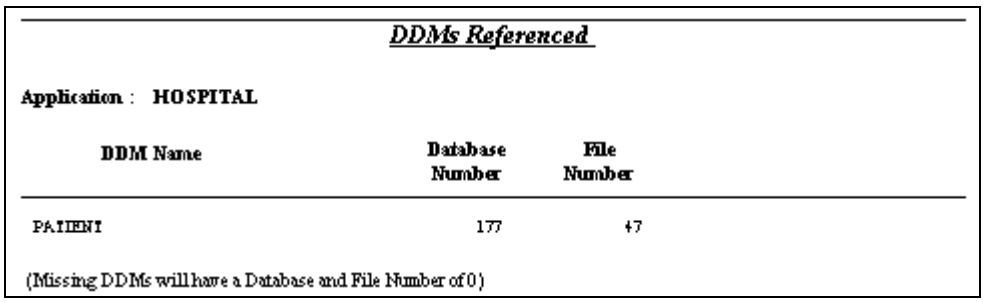
Figure 3-26 Natural Keywords Referenced Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Keyword	The Natural Keyword.
Object	The name of the object.
Line No.	The Natural line number for the statement.
Sub-Keyword	The class of the Keyword e.g., for a Keyword DECIDE the sub-keyword may say DECIDE VALUE.
Operation	The Natural Engineer defined relationship for the statement.
Data Element Name	The name of the item used in the object.

DDMs Referenced

Identifies all DDMs used in the application, by identifying all code usage and definitions within the application. The DDM Short Name is Natural Engineer's internal name assigned to the DDM.

The following Figure 3-27 illustrates the DDMs Referenced Report.



DDMs Referenced

Application : HOSPITAL

DDM Name	Database Number	File Number
PATIENT	177	47

(Missing DDMs will have a Database and File Number of 0)

Figure 3-27 DDMs Referenced Report

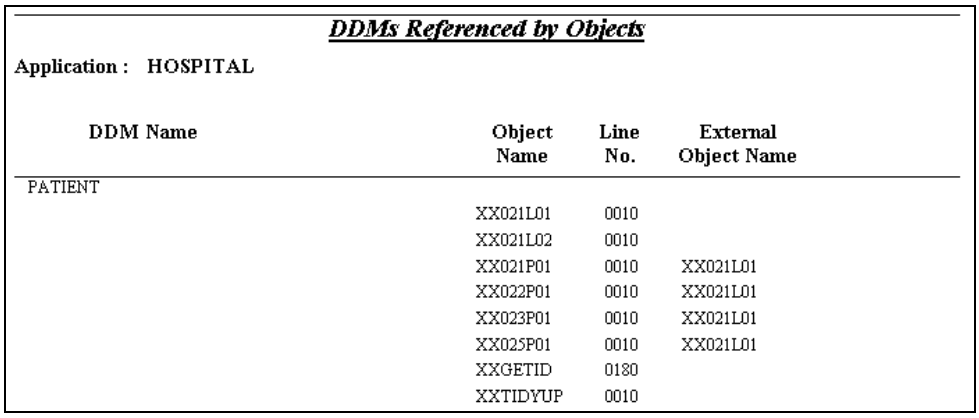
REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
DDM Name	The name of the DDM used to access the database.
Database Number	The Database Number associated with the DDM.
File Number	The File Number of the DDM.
DDM Short Name	A unique internal name used for the DDM. Natural Engineer uses the Database Number, File Number and a 2-byte sequence number.

Note: If the File Number is 0, the DDM was not found for the application and must be investigated for inclusion.

DDMs Referenced by Objects

Identifies, for DDMs, all objects within the application that reference them, indicating whether the definition is external for the object. This report is used to identify DDM usage with the application.

The following Figure 3-28 illustrates the DDMs Referenced by Objects Report.



DDMs Referenced by Objects

Application : HOSPITAL

DDM Name	Object Name	Line No.	External Object Name
PATIENT			
	XX021L01	0010	
	XX021L02	0010	
	XX021P01	0010	XX021L01
	XX022P01	0010	XX021L01
	XX023P01	0010	XX021L01
	XX025P01	0010	XX021L01
	XXGETID	0180	
	XXTIDYUP	0010	

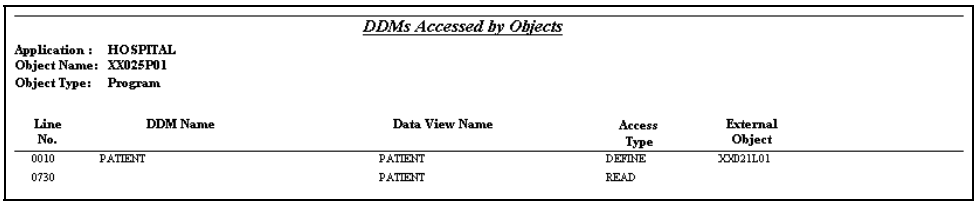
Figure 3-28 DDMs Referenced by Objects Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
DDM Name	The name of the DDM used to access the database.
Object Name	The name of the object.
Line No.	The Natural line number where the reference occurred.
External Object Name	The name of the object that contains the definition of the Data Area used within the object, and External Local Data Area.
DDM Short Name	A unique internal name used for the DDM. Natural Engineer uses the Database Number, File Number and a 2 byte sequence number

DDMs Accessed by Objects

Identifies the type of access to the DDMs by the objects that use them. This can either be directly or via an internal or external view definition. By viewing the types of access within the object, you can tell, for example, which objects update the file.

The following Figure 3-29 illustrates the DDMs Accessed by Objects Report.



DDMs Accessed by Objects

Application : HOSPITAL
Object Name: XX025P01
Object Type: Program

Line No.	DDM Name	Data View Name	Access Type	External Object
0010	PATIENT	PATIENT	DEFINE	XXD21L01
0730		PATIENT	READ	

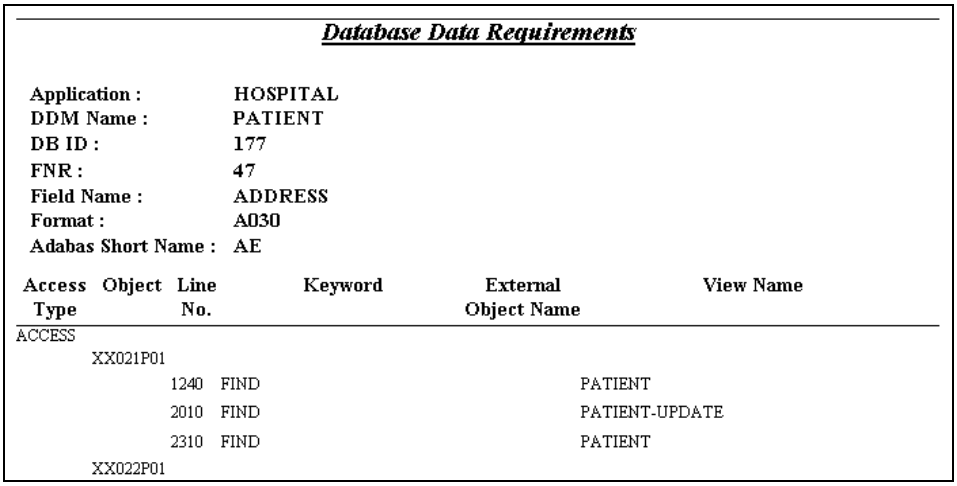
Figure 3-29 DDMs Accessed by Objects Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the object.
Object Type	Identifies the type of Natural object i.e., Map, Program, Local Data Area.
Line No.	The Natural line number for the statement.
DDM Name	The name of the DDM used to access the database.
Data View Name	The name of the View used to access the database.
Access Type	The type of Natural statement used to access the view, i.e., FIND, STORE.
DDM Short Name	A unique internal name used for the DDM. Natural Engineer uses the Database Number, File Number and a 2-byte sequence number.

Database Data Requirements

This report identifies the data requirements of an application.

The following Figure 3-30 illustrates the Database Data Requirements Report.



Database Data Requirements

Application : HOSPITAL
DDM Name : PATIENT
DB ID : 177
FNR : 47
Field Name : ADDRESS
Format : A030
Adabas Short Name : AE

Access Type	Object	Line No.	Keyword	External Object Name	View Name
ACCESS					
	XX021P01				
		1240	FIND		PATIENT
		2010	FIND		PATIENT-UPDATE
		2310	FIND		PATIENT
	XX022P01				

Figure 3-30 Database Data Requirements Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the object.
Object Type	Identifies the type of Natural object i.e., Map, Program, Local Data Area.
Line No.	The Natural line number for the statement.
DDM Name	The name of the DDM used to access the database.
Data View Name	The name of the View used to access the database.
Access Type	The type of Natural statement used to access the view, i.e., FIND, STORE.
DDM Short Name	A unique internal name used for the DDM. Natural Engineer uses the Database Number, File Number and a 2 byte sequence number.

Data Item Inventory

Shows all fields (data items) used by a specific object within the application. This report identifies all fields that the object has access to, whether they are defined in the object or defined externally.

The following Figure 3-31 illustrates the Data Item Inventory Report.

Data Item Inventory

Application : HOSPITAL
Object Name: XX025P01
Object Type: Program

Line No.	Data Element Name	Data Defn.	Array Bounds	External Object Name	Type
0090	#C-SELECTED	C			
0020	#G-MESSAGE	A70		XX000G00	GDA
0010	#G-SELECTED-OPTION	A1		XX000G00	GDA
0140	#M-NAME	A40	1:15		
0150	#M-PATIENT-ID	N7	1:15		

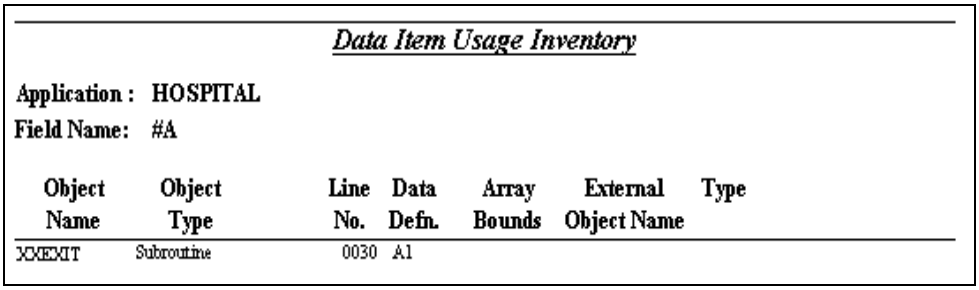
Figure 3-31 Data Item Inventory Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the object. For DDMs, this is the DDM short name followed by the name as known to the application.
Object Type	The type of Natural object, e.g., Map, Program, Local Data Area.
Line No.	The Natural line number for the statement.
Data Element Name	The name of the field used in the object. The name starts with the Group name, if applicable.
Data Defn.	The format and length of the Data Element.
Array Bounds	Contains the first array definition for the field.
External Object Name	The name of the object that contains the definition of the Data Area used within the object, i.e., External Local Data Area.
Type	The type of External Object.

Data Item Usage Inventory

Shows all fields (data items) used within the application. This report identifies for all data items the objects that use the data item, whether they are defined in the object or defined externally.

The following Figure 3-32 illustrates the Data Item Usage Inventory Report.



Data Item Usage Inventory

Application : HOSPITAL
Field Name: #A

Object Name	Object Type	Line No.	Data Defn.	Array Bounds	External Object Name	Type
XXEXIT	Subroutine	0030	A1			

Figure 3-32 Data Item Usage Inventory Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Field Name	The name of the field used in the object. The name starts with the Group name, if applicable.
Object Name	The name of the object. For DDMs, this is the DDM short name followed by the name as known to the application.
Object Type	The type of Natural object, e.g., Map, Program, Local Data Area.
Line No.	The Natural line number for the statement.
Data Defn.	The format and length of the Data Element.
External Object Name	The name of the object that contains the definition of the Data Area used within the object, i.e., External Local Data Area.
Type	The type of External Object.

Analysis: Impact Reports

The Impact Reports provide various types of information concerning the Impact Analysis results, including a view of used Search Criteria. Reports are available at the summary, object and detailed data item levels.

You can view this information in any one of several reporting display modes:

- In a Browser.
- In textual format on the Natural screen, using Natural Reporter or MS Excel spreadsheet package.

Note: For more information on the different Reporting Display Modes refer to Chapter 1 of this manual.

The Impact Reports can be accessed using the following menu navigation: Analysis ➔Impact Reports.

The following table summarizes the Impact Reports:

REPORT ID	REPORT NAME	DESCRIPTION
	Bulk Report Generator	This allows you to select reports to be executed at the same time. You can use this option to produce all reports for viewing later.
IMPSCL	**Search Criteria**	Lists the Search Criteria used for this execution of the Impact Analysis.
IMPAIS	**Application Impact Summary**	Provides a high-level view of the Impact on the Application, by Object Type.
IMPOIS	**Object Impact Summary**	Identifies for each object both the number of impacted lines of code and data elements.
IMPEXX	**Impacted External Objects**	Identifies if any impacted fields are passed to External Objects.
IMPEXW	**Impacted External Interfaces**	Identifies if any WRITE or READ workfile statements have been impacted.
IMPCMO	**Impacted Construct Models**	Identifies if any Construct models have been impacted by other Data Items.
IMPPCO	**Impacted Predict Case**	Identifies if any Predict Case Generated Objects

REPORT ID	REPORT NAME	DESCRIPTION
	Components	have been impacted by other Data Items.
IMPDII	**Data Item Impact Inventory**	Identifies impacted data items, by Object, used in the Application.
IMPSDI	**Data Item Impact Steplib Inventory**	Identifies for each object any other impacts for the object in other applications.
IMPFLD	**Data Item Impact Usage Inventory**	Identifies for each Data item the impacted objects that the field is in.
	View Impacted Source Code	Allows the viewing of program type objects within an Internet Browser with Impacted Code highlighted.

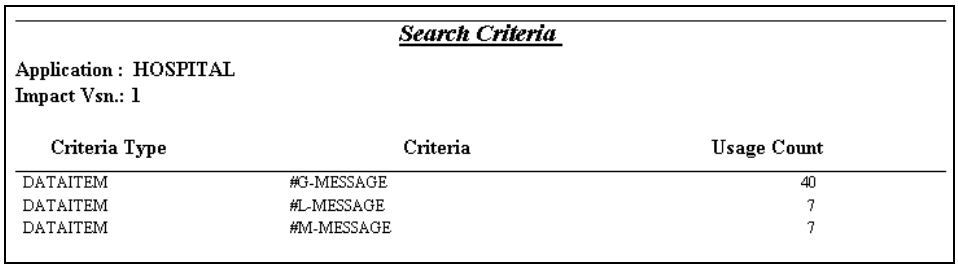
The table shows the report ids for each report. These are used within the REPORTER section of the NATENG.INI file to set the default report display mode for each report.

Note: For more information on the NATENG.INI file section REPORTER refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Search Criteria

This report lists the Search Criteria used for this execution of the Impact Analysis. You can keep the Search Criteria versioned with the other impact reports.

The following Figure 3-33 Search Criteria Report.



Search Criteria

Application : HOSPITAL
Impact Vsn.: 1

Criteria Type	Criteria	Usage Count
DATAITEM	#G-MESSAGE	40
DATAITEM	#L-MESSAGE	7
DATAITEM	#M-MESSAGE	7

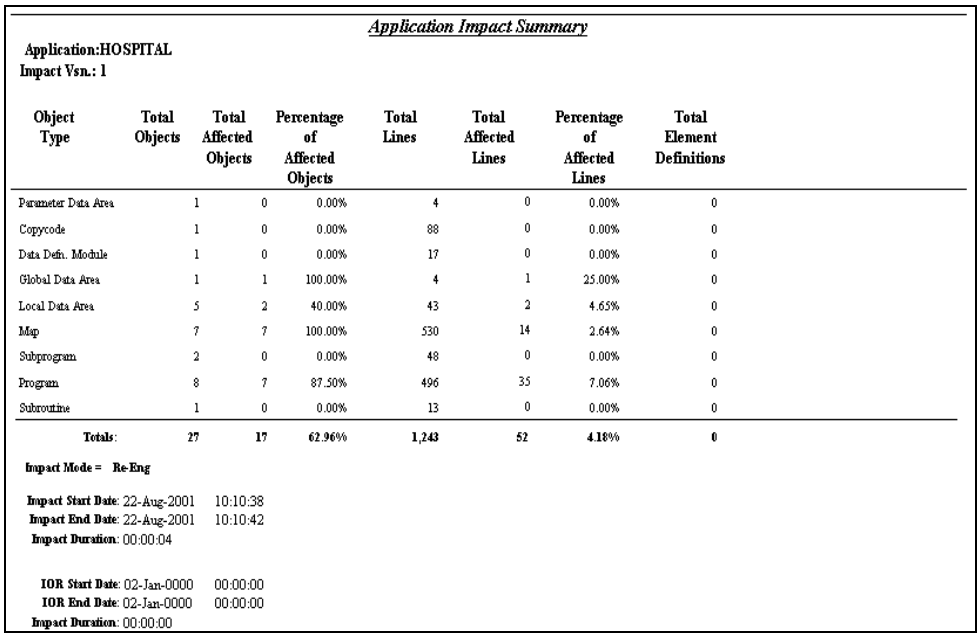
Figure 3-33 Search Criteria Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Criteria Type	The primary keyword used in the search, e.g., DBFILE.
Criteria	The search value used to refine the search.
Usage Count	The number of impacts identified by each criteria.

Application Impact Summary

This report provides a high-level view of the impact on the application, by object type. This is the initial view of the impact of the Search Criteria. You can see the overall number of lines and data elements affected. You can use this report for an initial preparation of resources and duration of the Modification process.

The following Figure 3-34 Application Impact Summary Report.



Application Impact Summary

Application:HOSPITAL
Impact Vsn.: 1

Object Type	Total Objects	Total Affected Objects	Percentage of Affected Objects	Total Lines	Total Affected Lines	Percentage of Affected Lines	Total Element Definitions
Parameter Data Area	1	0	0.00%	4	0	0.00%	0
Copycode	1	0	0.00%	88	0	0.00%	0
Data Defn. Module	1	0	0.00%	17	0	0.00%	0
Global Data Area	1	1	100.00%	4	1	25.00%	0
Local Data Area	5	2	40.00%	43	2	4.65%	0
Map	7	7	100.00%	530	14	2.64%	0
Subprogram	2	0	0.00%	48	0	0.00%	0
Program	8	7	87.50%	496	35	7.06%	0
Subroutine	1	0	0.00%	13	0	0.00%	0
Totals:	**27**	**17**	**62.96%**	**1,243**	**52**	**4.18%**	**0**

Impact Mode = Re-Eng

Impact Start Date: 22-Aug-2001 10:10:38
Impact End Date: 22-Aug-2001 10:10:42
Impact Duration: 00:00:04

IOR Start Date: 02-Jan-0000 00:00:00
IOR End Date: 02-Jan-0000 00:00:00
Impact Duration: 00:00:00

Figure 3-34 Application Impact Summary Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the application being processed.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Object Type	Identifies the type of Natural object. i.e. Map, Program, Local Data Area.
Total Objects	The number of objects in the Application.

REPORT ITEM	DESCRIPTION
Total Affected Objects	The number of objects impacted by execution of the Search Criteria.
Percentage of Affected Objects	Total Affected Objects/ Total Objects*100.
Total Lines	The number of syntax lines of code.
Total Affected Lines	The number of syntax lines of code impacted by the execution of the Search Criteria.
Percentage of Affected Lines	Total Affected Lines/ Total Lines*100
Total Element Definitions	The number of defined data elements identified as affected by the Search Criteria.
Impact Mode	Identifies the type of Impact Analysis that was used, for example Re-Eng.
Impact Start Date	The date and time that the impact processes started.
Impact End Date	The date and time that the impact processes ended.
Impact Duration	The time taken for the impact process to be completed. The Start Date is subtracted from the End Date.
IOR Start Date	The date and time that the inter object tracing process started.
IOR End Date	The date and time that the inter object tracing process ended.
IOR Duration	The time taken for the inter object tracing process to be completed. The Start Date is subtracted from the End Date.

Note: Comment lines are not included in line counts. Lines are counted only once for multiple impacts. INCLUDE statement lines are not marked or counted as impacted.

Object Impact Summary

This report shows the same type of information as the, broken down for each object in the application. It is thus possible to identify the objects with a significantly higher number of impacts as against those with a low impact.

The following Figure 3-35 Object Impact Summary Report.

Object Impact Summary

Application: HOSPITAL
Impact Vsn.: 1

Object Type	Object Name	Steplib Application	Total Objects	Total Lines	Total Affected Lines	Percentage Of Affected Lines	Total Element Definitions
Global Data Area							
	XX000G00			4	1	25.00%	0
	Totals:		**1**	**4**	**1**		**0**
Local Data Area							
	XX001L01			4	1	25.00%	0
	XX002L01			4	1	25.00%	0
	Totals:		**2**	**8**	**2**		**0**

Figure 3-35 Object Impact Summary Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Object Type	The type of Natural object, e.g., Map, Program, Local Data Area.
Object Name	The name of the object.
Steplib Application	The name of the steplib application from which the object was extracted.
Total Objects	The total number of objects for each Object Type.
Total Lines	The number of syntax lines of code per object, object type and application.
Total Affected Lines	The number of lines of code impacted by the execution of the Search Criteria, per object, object type and application.
Percentage of Affected Lines	Total Affected Lines / Total Lines * 100.
Total Element Definitions	The number of defined data elements identified as affected by the Search Criteria, per object, object type and application.

Note: Comment lines are not included in line counts.

Impacted External Objects

This report identifies any external objects that have impacted code passed to them. This report can be used to identify which external routines are impacted. The owner of the external routine can determine if there is a replacement module, or whether a change to the impacted routine is required.

Any missing Natural object in the Natural Engineer Repository is classed as external to the application, and if impacted will appear on this report.

The following Figure 3-36 Impacted External Objects Report.

Impacted External Objects

Application : HOSPITAL
Impact Vsn.: 2

Keyword	Call Name	Object Name	Object Type	Line No.	Data Element Name	Match Reason	Match Criteria	Match Object
CALLNAT	NEEEXN01							
		NEEEXP01	PROGRAM	0330	#MESSAGE		DATAITEM ?MESSAGE?	
CALLNAT	NEEEXN02							
		NEEEXP02	PROGRAM	0230	#MESSAGE		DATAITEM ?MESSAGE?	

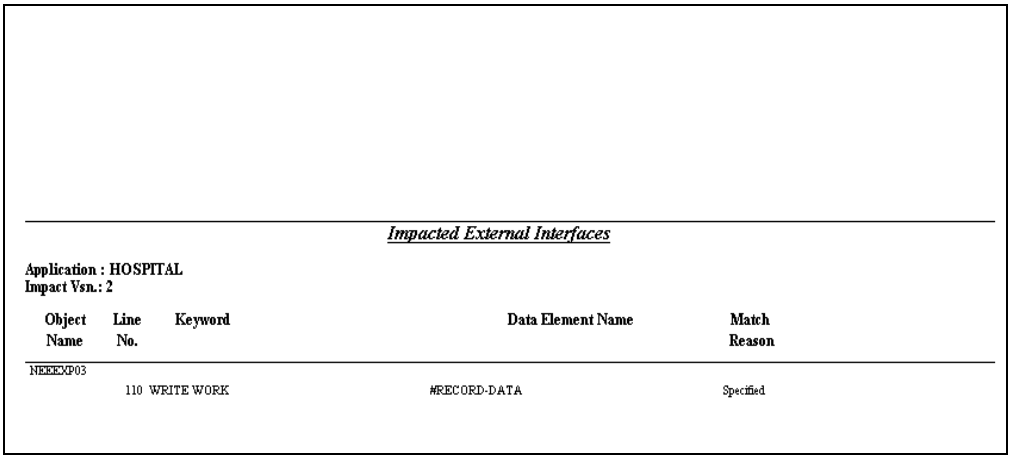
Figure 3-36 Impacted External Objects Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the Application being processed.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Keyword	The keyword used to reference the external object e.g., RULEVAR.
Call Name	The name of the external routine.
Object Name	The name of the object.
Object Type	The type of object.
Line No.	The Natural line number for the statement.
Data Element Name	The name of the data element (local or view) used.
Match Reason	How an impact was identified.
Match Criteria	The actual match made, either by a search criterion or another Data Item. For data areas and DDMs, the programming object is identified if an impact was found in it.
Match Object	The name of the object that the criteria was matched in.

Impacted External Interfaces

This report identifies any access to work files with data items that have been impacted. This report can be used to identify which work files are actually used by another application.

The following Figure 3-37 Impacted External Interfaces Report.



Impacted External Interfaces

Application : HOSPITAL
Impact Vsn.: 2

Object Name	Line No.	Keyword	Data Element Name	Match Reason
NEEEXP03				
	110	WRITE WORK	#RECORD-DATA	Specified

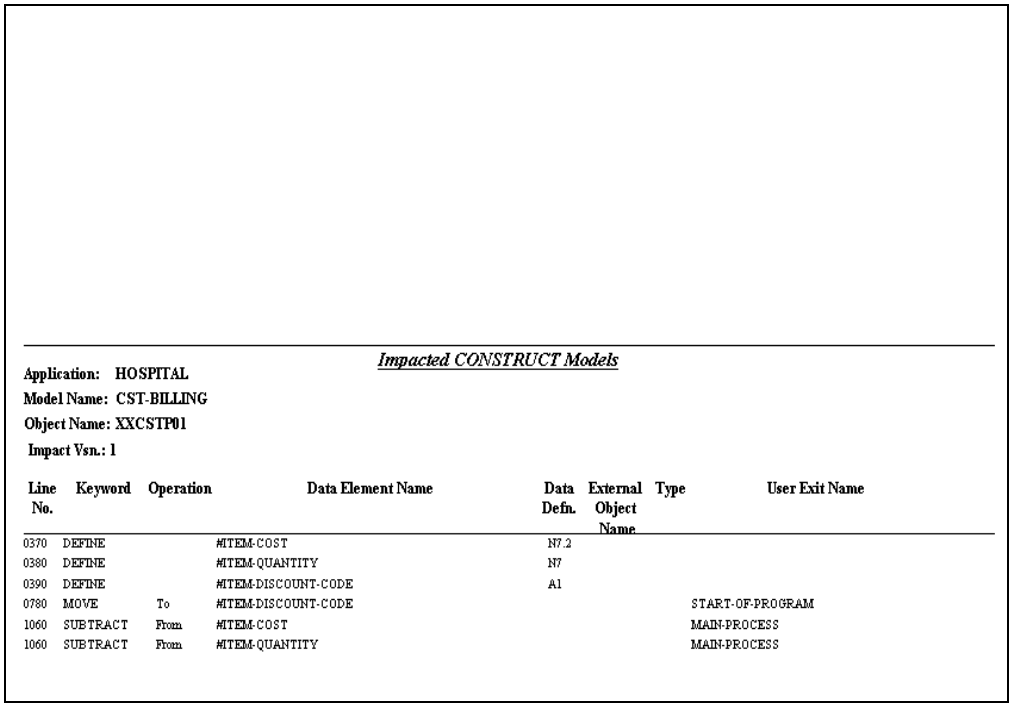
Figure 3-37 Impacted External Interfaces Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the Application being processed.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Object Name	The name of the Object.
Line No.	The Natural line number for the statement.
Keyword	The keyword used to reference the Data Element on the line.
Data Element Name	The name of the field (local or view) used in the object.
Match Reason	How an impact was identified.

Impacted Construct Models

This report identifies any Construct models that have impacted data items passed to them. The owner of the model can determine if there is a replacement module, or whether a change to the impacted model is required.

The following Figure 3-38 Impacted Construct Models Report.



Impacted CONSTRUCT Models

Application: HOSPITAL
Model Name: CST-BILLING
Object Name: XXCSTP01
Impact Vsn.: 1

Line No.	Keyword	Operation	Data Element Name	Data Defn.	External Object Name	Type	User Exit Name
0370	DEFINE		#ITEM-COST	N7.2			
0380	DEFINE		#ITEM-QUANTITY	N7			
0390	DEFINE		#ITEM-DISCOUNT-CODE	A1			
0780	MOVE	To	#ITEM-DISCOUNT-CODE				START-OF-PROGRAM
1060	SUBTRACT	From	#ITEM-COST				MAIN-PROCESS
1060	SUBTRACT	From	#ITEM-QUANTITY				MAIN-PROCESS

Figure 3-38 Impacted Construct Models Report

REPORT ITEM	DESCRIPTION
Application	Identifies the name of the Application being processed.
Model Name	The name of the model.
Object Name	The name of the object.
Impact Vsn.	The version of the Impact to which the criteria are applicable.

REPORT ITEM	DESCRIPTION
Line No.	The Natural line number for the statement.
Keyword	The keyword used to reference the Data Element on the line, e.g., ASSIGN, IF.
Operation	The Natural Engineer defined relationship for the statement, e.g. From, To.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
External Object Name	The name of the object that contains the definition of the Data Area used within the object i.e., External Local Data Area.
Type	The type of external object.
User Exit Name	Identifies if the impacts are in User Exit code, and which exit.

Impacted Predict Case Components

This report identifies any Predict Case Components that have impacted data items within them. The owner of the component can determine if there is a replacement module, or whether a change to the impacted component is required.

The following Figure 3-39 Impacted Predict Case Components Report.

Impacted Predict Case Components

Application: HOSPITAL
Component: NEXT-ACTION-DETAILS
Type: System Function
Impact Vsn.: 1

Program	Line No.	Keyword	Operation	Data Element Name	Data Defn.	External Object Name	Type	Nested PCA
XXPCAP01								
	1230	DEFINE		#G-ALL-GLOBALS.#G-TIME	N1	XXPCAG00	GDA	DETAIL-DISPLAY-DEFINITIONS
	0570	DECIDE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0580	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0600	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0600	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0600	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0600	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT
	0600	DECIDE VALUE	From	#G-TIME				CONVERT-TIME-FORMAT

Figure 3-39 Impacted Predict Case Components Report

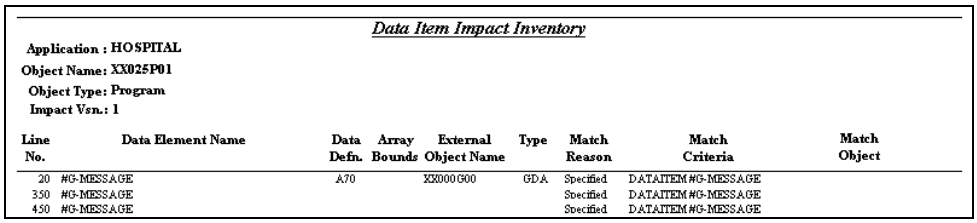
REPORT ITEM	DESCRIPTION
Application	Identifies the name of the Application being processed.
Component	The name of the Predict Case Component.
Type	The type of the Predict Case Component e.g., System Function, Frame.
Object Name	The name of the Object.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Line No.	The Natural line number for the statement.
Keyword	The keyword used to reference the Data Element on the line.
Operation	The Natural Engineer defined relationship for the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
External Object Name	The name of the object that contains the definition of the Data Area used within the object. i.e., External Local Data Area.
Type	The type of external object.
Nested PCA	If the Predict Case component is nested within another Predict Case Component then this field shows the name of the parent.

Data Item Impact Inventory

This report identifies all data elements impacted for each object, together with the reason the impact occurred. From this list you can trace impact back to the specified Search Criteria.

Verify that there are no missing objects, including DDMs before Impact Analysis is executed. If there are missing objects, use the Object Impact Detail (by Name) Report to see all elements impacted.

The following Figure 3-40 Data Item Impact Inventory Report.



Data Item Impact Inventory

Application : HOSPITAL
Object Name: XX025P01
Object Type: Program
Impact Vsn.: 1

Line No.	Data Element Name	Data Defn.	Array Bounds	External Object Name	Type	Match Reason	Match Criteria	Match Object
20	#G-MESSAGE	A70		XX000G00	GDA	Specified	DATAITEM #G-MESSAGE	
350	#G-MESSAGE					Specified	DATAITEM #G-MESSAGE	
450	#G-MESSAGE					Specified	DATAITEM #G-MESSAGE	

Figure 3-40 Data Item Impact Inventory Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Line No.	The Natural line number of the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
Array Bounds	Contains the first array definition for the field.
External Object Name	The name of the object that contains the definition of the Data Area used within the object i.e., External Local Data Area.
Type	The type of External Object.
Match Reason	How an impact was identified.

REPORT ITEM	DESCRIPTION
Match Criteria	The actual match made, either by a search criterion or another Data Item. For data areas and DDMs, the programming object is identified if an impact was found in it.
Match Object	The name of the object that the criteria was matched in.

Data Item Impact Steplib Inventory

This report identifies all data elements impacted for each object, together with the reason the impact occurred. This report also shows any other impacts that exist for each object that has been used in another application where this application has been used as a steplib.

From this list you can trace impact back to the specified Search Criteria, and also identify other impacted applications.

This report can be viewed in one of two ways:

1. From the steplib application.

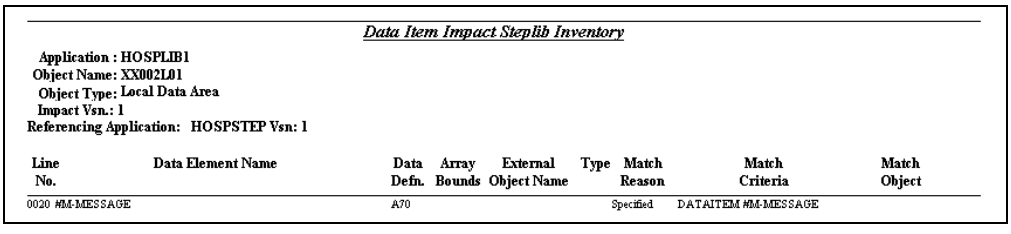
The report will show all the impacts for each of the objects within the steplib application first, followed by the impacts in the referencing applications.

2. From an application that references a steplib application.

The report will show all the impacts for each object for the selected application and impact version, followed by impacts for the steplib objects referenced by the application, followed by impacts for each application (for all impact versions) referencing the steplib application.

Note: When referencing a steplib application, the steplib application must be loaded into the Repository first before any application that references it.

The following Figure 3-41 Data Item Impact Steplib Inventory Report.



Data Item Impact Steplib Inventory

Application : HOSPLIB1
Object Name: XX002L01
Object Type: Local Data Area
Impact Vsn.: 1
Referencing Application: HOSPSTEP Vsn: 1

Line No.	Data Element Name	Data Defn.	Array Bounds	External Object Name	Type	Match Reason	Match Criteria	Match Object
0020 #M-MESSAGE		A70				Specified	DATAITEM #M-MESSAGE	

Figure 3-41 Data Item Impact Steplib Inventory Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Line No.	The Natural line number of the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
Array Bounds	Contains the first array definition for the field.
External Object Name	The name of the object that contains the definition of the Data Area used within the object i.e., External Local Data Area.
Type	The type of External Object.
Match Reason	How an impact was identified.
Match Criteria	The actual match made, either by a search criterion or another Data Item. For data areas and DDMs, the programming object is identified if an impact was found in it.
Match Object	The name of the object that the criteria was matched in.

Data Item Impact Usage Inventory

This report identifies all data elements impacted for the application and then shows each object that the data element was impacted in.

From this list you can identify where the impacts for the field are across the application.

The following Figure 3-42 Data Item Impact Usage Inventory Report.

Data Item Impact Usage Inventory

Application : HOSPITAL
Field Name: #G-MESSAGE
Impact Vsn.: 1

Object Name	Object Type	Line No.	Data Defn.	External Object Name	Type	Match Reason	Match Criteria	Match Object
XX000G00	Global Data Area	0020	A70			Specified	DATAITEM #G-MESSAGE	
XX001P01	Program	0020	A70	XXD00G00	GDA	Specified	DATAITEM #G-MESSAGE	
XX002P01	Program	0020	A70	XXD00G00	GDA	Specified	DATAITEM #G-MESSAGE	
XX021M01	Map	0170	A70			Specified	DATAITEM #G-MESSAGE	
XX021M01	Map	0910				Specified	DATAITEM #G-MESSAGE	
XX021P01	Program	0020	A70	XXD00G00	GDA	Specified	DATAITEM #G-MESSAGE	
XX021P01	Program	0960				Specified	DATAITEM #G-MESSAGE	
XX021P01	Program	1320				Specified	DATAITEM #G-MESSAGE	
XX021P01	Program	2200				Specified	DATAITEM #G-MESSAGE	
XX021P01	Program	2210				Specified	DATAITEM #G-MESSAGE	
XX022M01	Map	0170	A70			Specified	DATAITEM #G-MESSAGE	
XX022M01	Map	0880				Specified	DATAITEM #G-MESSAGE	
XX022P01	Program	0020	A70	XXD00G00	GDA	Specified	DATAITEM #G-MESSAGE	
XX022P01	Program	0230				Specified	DATAITEM #G-MESSAGE	
XX022P01	Program	0340				Specified	DATAITEM #G-MESSAGE	
XX022P01	Program	0430				Specified	DATAITEM #G-MESSAGE	
XX023M01	Map	0050	A70			Specified	DATAITEM #G-MESSAGE	
XX023M01	Map	0960				Specified	DATAITEM #G-MESSAGE	
XX023P01	Program	0020	A70	XXD00G00	GDA	Specified	DATAITEM #G-MESSAGE	

Figure 3-42 Data Item Impact Usage Inventory Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Field Name	The name of the field used in the object, locally or from a View.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.

REPORT ITEM	DESCRIPTION
Line No.	The Natural line number of the statement.
Data Defn.	Data Definition. The format and length of the Data Element.
External Object Name	The name of the object that contains the definition of the Data Area used within the object i.e., External Local Data Area.
Type	The type of External Object.
Match Reason	How an impact was identified.
Match Criteria	The actual match made, either by a search criterion or another Data Item. For data areas and DDMs, the programming object is identified if an impact was found in it.
Match Object	The name of the object that the criteria was matched in.

View Impacted Source Code

This report displays the application source code, with the impacted elements highlighted. To make use of this report, you need access to a Browser. A selection box allows you to select the object for display. The Browser options are shown below:

Mark Excluded Fields	Code excluded by the Search Criteria will be highlighted.
Show External Areas	External areas will be included in the object and highlighted.
Show External Copycode	Copycode will be included in the object and highlighted.
Show Impacts Only	Only impacted code will be displayed and not all object code.

The following Figure 3-43 illustrates the View Impacted Source Code Report.

3 Natural Engineer Reporting

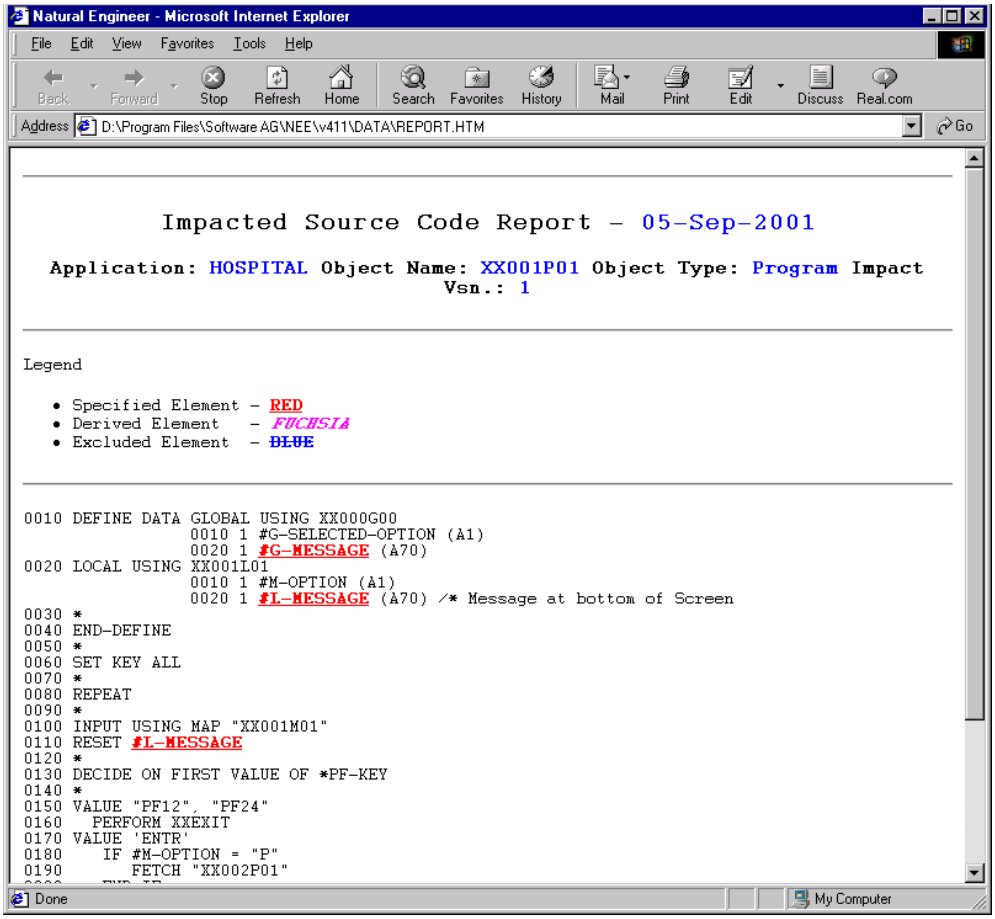


Figure 3-43 View Impacted Source Code Report

SCREEN ITEMS	DESCRIPTION
Date	Date on which the source code report was executed.
Application	The name of the application to which the source code belongs.
Object Name	The name of the object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Impact Vsn.	The version of the Impact to which the criteria are applicable.
Legend	Identifies the color coding for the highlighting of the Natural code: - Specified element. - Derived element. - Excluded element.
Source Code Listing	Source Code is listed with highlights of impacted components.

Modification Reports

The Modification Reports provide various levels of information for reviewing and processing the identified impacts and modifications, before and after Modification execution. Reports are available at the summary, object and detailed data item levels.

You can view this information in any one of several reporting display modes:

- In a Browser.
- In textual format on the Natural screen, using Natural Reporter or MS Excel spreadsheet package.

Note: For more information on the different Reporting Display Modes refer to Chapter 1 of this manual.

The Modification Reports can be accessed using the following menu navigation: Modification➔Modification Reports.

The following table summarizes the Modification Reports:

REPORT ID	REPORT NAME	DESCRIPTION
	Bulk Report Generator	This allows you to select reports to be executed at the same time. You can use this option to produce all reports for viewing later.
REMAIS	**Application Modification Summary**	Provides a high-level view of the modification for the application, by object type.
REMOIS	**Object Modification Summary**	Identifies the potential modification on the objects by object type.
REMCTS	**Category / Type Summary**	Shows a breakdown of the types of changes required for the application and how they can be made.
REMPRD	**PREDICT Changes**	Identifies changes required to each DDM.
REMDII	**Data Item Inventory Modification**	Identifies data elements for modification, by object, used in the application.
REMDIA	**Data Item Inventory for Automatic Modification**	Identifies data elements for modification, by object, used in the application, which can be executed automatically.

REPORT ID	REPORT NAME	DESCRIPTION
REMDIM	**Data Item Inventory for Manual Modification**	Identifies data elements for modification, by object, used in the application which must be executed manually.
REMCPY	**Impacted Objects Not Directly Modified**	Identifies objects that are impacted but not directly modified. These must be copied to the Modification library and re-STOWed.
REMCMO	**Construct Models Not Directly Modified**	Identifies if any Construct models have been impacted by other Items and require manual Modification.
REMDDR	**Database Data Requirements Modification**	Identifies DDM and fields impacted in modified objects.
	View Modify Source Code	Display the modified code in the Browser. Modified data items are marked.

The table shows the report ids for each report. These are used within the REPORTER section of the NATENG.INI file to set the default report display mode for each report.

Note: For more information on the NATENG.INI file section REPORTER refer to Chapter 1 in the Natural Engineer Administration Guide for Windows manual.

Application Modification Summary

This report provides summary information for object types that are to be remedied.

The following Figure 3-44 Application Modification Summary Report.

Application Modification Summary

Application:HOSPITAL
Impact Vsn.: 1

Object Type	Total Objects	Total Objects for Modification	Percentage of Objects for Modification	Total Lines	Total Lines for Modification	Percentage of Lines for Modification
Parameter Data Area	1	0	0.00%	4	0	0.00%
Copycode	1	0	0.00%	88	0	0.00%
Data Defn. Module	1	1	100.00%	17	1	5.88%
Global Data Area	1	1	100.00%	4	1	25.00%
Local Data Area	5	4	80.00%	43	5	11.63%
Map	7	7	100.00%	530	14	2.64%
Subprogram	2	0	0.00%	48	0	0.00%
Program	8	7	87.50%	496	30	6.05%
Subroutine	1	0	0.00%	13	0	0.00%
Totals:	**27**	**20**	**74.07%**	**1,243**	**51**	**4.10%**

(Comment lines not included)

Figure 3-44 Application Modification Summary Report

REPORT ITEM	DESCRIPTION
Application	The name of the Application being processed.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Total Objects	Shows the total number of objects under review for Modification.
Total Modified Objects	The number of objects that have been modified.
Percentage of Modified Objects	Total Modified Objects / Total Objects * 100.
Total Lines	A count of the number of syntax lines in the objects for Modification.

REPORT ITEM	DESCRIPTION
Total Modified Lines	The total number of lines of code for Modification.
Percentage of Modified Lines	Total Modified Lines / Total Lines * 100.

Note: The number of modified objects can be different from the number of impacted objects, if an impacted object has no changes required in it. Comment lines are NOT included in line counts.

Object Modification Summary

This report shows the same type of information as the Application Modification Summary report, but at the object level.

The following Figure 3-45 Object Modification Summary Report.

Object Modification Summary

Application: HOSPITAL
Impact Vsn.: 1

Object Type	Object Name	Steplib Application	Total Objects	Total Lines	Total Lines for Modification	Percentage of Lines for Modification	Execution Date	User ID
Data Defn. Module								
	PATIENT			17	1	5.88%		
	Totals:		**1**	**17**	**1**	**5.88%**		
Global Data Area								
	XX000G00			4	1	25.00%		
	Totals:		**1**	**4**	**1**	**25.00%**		
Local Data Area								
	XX001L01			4	1	25.00%		
	XX002L01			4	1	25.00%		
	XX021L01			20	2	10.00%		
	XX021L02			11	1	9.09%		
	Totals:		**4**	**39**	**5**	**12.82%**		

Figure 3-45 Object Modification Summary Report

REPORT ITEM	DESCRIPTION
Application	The name of the Application being processed.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Object Name	The name of the Object.
Steplib Application	The name of the application that the object was extracted from

REPORT ITEM	DESCRIPTION
Total Objects	The total number of objects for each Object Type.
Total Lines	Shows the total number of syntax lines in the object for Modification.
Total Lines for Modification	The number of lines of code for Modification.
Percentage of Lines for Modification	Percentage of Lines for Modification.
Execution Date	Date the object was modified with automatic changes.
User ID	The User-ID of the person who executed Modification of the object.

Note: The number of modified objects can be different from the number of impacted objects, if an impacted object has no changes required in it. Comment lines are NOT included in line counts.

Category / Type Summary

This report shows the number of changes for each Modification category and type identified by Natural Engineer.

The following Figure 3-46 Category / Type Summary Report.

Category / Type Summary

Application : HOSPITAL
Impact Vsn.: 1

Category	Type	Totals	Type of Categories %	Type Natural Engineer Categories %
Automatic				
	Data Item	42	85.71%	80.77%
	DB File & Field	7	14.29%	13.46%
	Total:	**49**	**100.00%**	**94.23%**
Manual				
	Data Item	3	100.00%	5.77%
	Total:	**3**	**100.00%**	**5.77%**
	Natural Engineer Total:	**52**		**100.00%**
External				
	PREDICT changes	0		
	PATTERN matches	0		
	GENERATED Code	0		

Figure 3-46 Category / Type Summary Report

REPORT ITEM	DESCRIPTION
Application	The name of the Application being processed.
Category	The category for each change, e.g., Automatic or Manual.
Type	Identifies the type of change e.g., Length increase, system date or edit mask.
Totals	The total number of changes for each type and category.
Type of Categories %	For each category, the percentage of changes for each type.

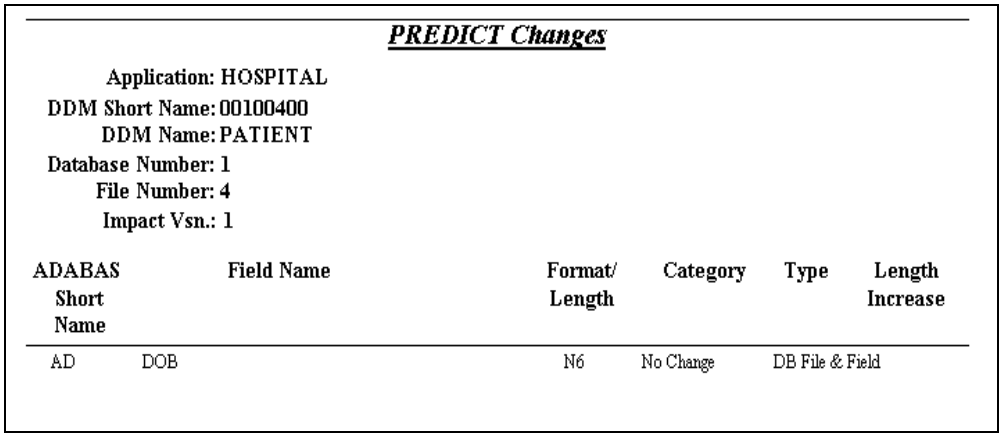
REPORT ITEM	DESCRIPTION
Type Natural Engineer Categories %	The percentage of each type within each category.
Predict Changes	Number of Predict changes required.
Pattern Matches	Number of pattern matches found.
Generated Code	Number of lines of impacted Generated Code.

Predict Changes

Natural Engineer reports changes that are required for each DDM related to the application. Natural Engineer does not apply these changes. You must first change the Adabas file definitions and then regenerate the DDMs.

You access the report on Predict impacts via the Predict Changes option on the Modification menu.

The following Figure 3-47 Predict Changes Report.



PREDICT Changes

Application: HOSPITAL
DDM Short Name: 00100400
DDM Name: PATIENT
Database Number: 1
File Number: 4
Impact Vsn.: 1

ADABAS Short Name	Field Name	Format/ Length	Category	Type	Length Increase
AD	DOB	N6	No Change	DB File & Field	

Figure 3-47 Predict Changes Report

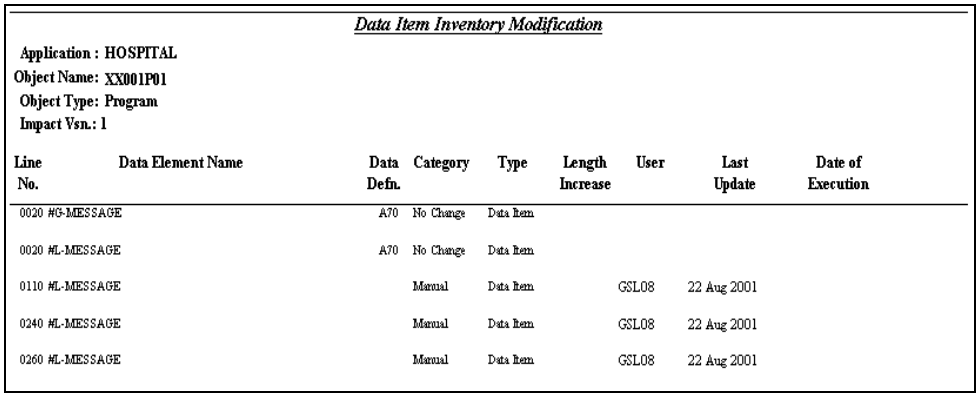
REPORT ITEM	DESCRIPTION
Application	The name of the application being modified.
DDM Short Name	The unique Natural Engineer identifier for the DDM.
DDM Name	The name of the DDM.
Database Number	The number of the database.
File Number	The number of the file.
Adabas Short Name	The Adabas short name of the field.
Field Name	The name of the field identified as impacted.
Format/Length	Current format and length.

REPORT ITEM	DESCRIPTION
Category	The process option for the change
Type	The type of change to be made.
Length Increase	The increase required to the length of the field.

Data Item Inventory Modification

This report identifies the Modification associated with each data element in each object. This is the complete list of changes that Natural Engineer will make or has identified to be required.

The following Figure 3-48 Data Item Inventory Modification Report.



Data Item Inventory Modification

Application : HOSPITAL
Object Name: XX001P01
Object Type: Program
Impact Vsn.: 1

Line No.	Data Element Name	Data Defn.	Category	Type	Length Increase	User	Last Update	Date of Execution
0020	#G-MESSAGE	A70	No Change	Data Item				
0020	#L-MESSAGE	A70	No Change	Data Item				
0110	#L-MESSAGE		Manual	Data Item		GSL08	22 Aug 2001	
0240	#L-MESSAGE		Manual	Data Item		GSL08	22 Aug 2001	
0260	#L-MESSAGE		Manual	Data Item		GSL08	22 Aug 2001	

Figure 3-48 Data Item Inventory Modification Report

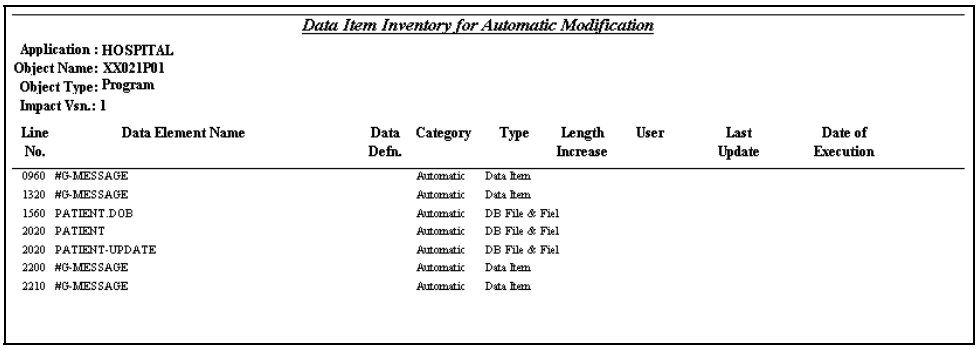
REPORT ITEM	DESCRIPTION
Application	The name of the Application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Line No.	The Natural line number of the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
Category	The category for each change, e.g., Automatic, Manual
Type	Identifies the type of change, e.g., Length increase, system date or edit mask.
Length Increase	The increase required to the length of the field.

REPORT ITEM	DESCRIPTION
User	Identifies the user ID that last changed the category, type or comments. Natural Engineer uses the user-ID {IMPACT} to identify its default categories.
Last Update	The date that field information was last modified.
Date of Execution	The date that the element was modified using Natural Engineer.

Data Item Inventory for Automatic Modification

This report is similar to the Data Item Inventory Modification report but only includes Automatic changes, that is, changes that Natural Engineer will make.

The following Figure 3-49 Data Item Inventory for Automatic Modification Report.



Data Item Inventory for Automatic Modification

Application : HOSPITAL
Object Name: XX021P01
Object Type: Program
Impact Vsn.: 1

Line No.	Data Element Name	Data Defn.	Category	Type	Length Increase	User	Last Update	Date of Execution
0960	#G-MESSAGE		Automatic	Data Item				
1320	#G-MESSAGE		Automatic	Data Item				
1560	PATIENT.DOB		Automatic	DB File & Fiel				
2020	PATIENT		Automatic	DB File & Fiel				
2020	PATIENT-UPDATE		Automatic	DB File & Fiel				
2200	#G-MESSAGE		Automatic	Data Item				
2210	#G-MESSAGE		Automatic	Data Item				

Figure 3-49 Data Item Inventory for Automatic Modification Report

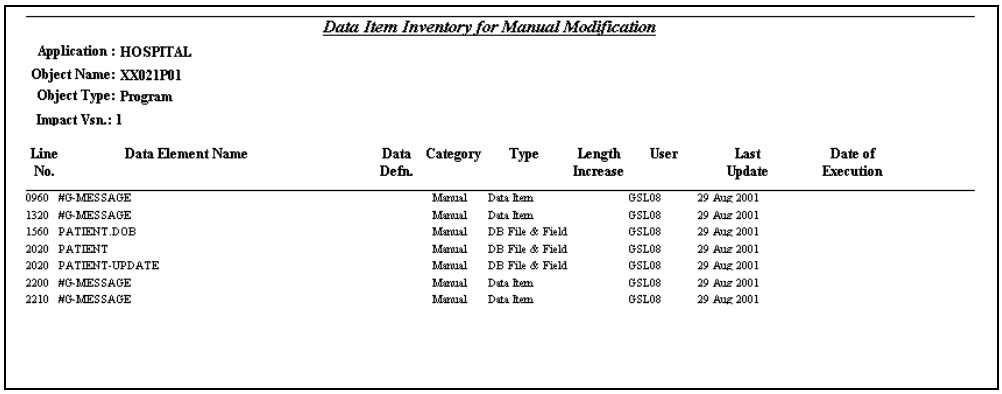
REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.
Line No.	The Natural line number of the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
Category	The category for each change, in this case: Automatic.
Type	Identifies the type of change e.g. length increase, system date or edit mask.
Length Increase	The increase required to the length of the field.
User	Identifies the User ID that last changed the category, type or comment. Natural Engineer uses the user-ID {IMPACT} to identify its default categories.

REPORT ITEM	DESCRIPTION
Last Update	The date that field information was last modified.
Date of Execution	The date that the element was modified using Natural Engineer.

Data Item Inventory for Manual Modification

This report is similar to the Data Item Inventory Modification report but only includes Manual changes, that is, changes that Natural Engineer will NOT make.

The following Figure 3-50 Data Item Inventory for Manual Modification Report.



Data Item Inventory for Manual Modification

Application : HOSPITAL
Object Name: XX021P01
Object Type: Program
Impact Vsn.: 1

Line No.	Data Element Name	Data Defn.	Category	Type	Length Increase	User	Last Update	Date of Execution
0960	#G-MESSAGE		Manual	Data Item		GSL08	29 Aug 2001	
1320	#G-MESSAGE		Manual	Data Item		GSL08	29 Aug 2001	
1560	PATIENT.DOB		Manual	DB File & Field		GSL08	29 Aug 2001	
2020	PATIENT		Manual	DB File & Field		GSL08	29 Aug 2001	
2020	PATIENT-UPDATE		Manual	DB File & Field		GSL08	29 Aug 2001	
2200	#G-MESSAGE		Manual	Data Item		GSL08	29 Aug 2001	
2210	#G-MESSAGE		Manual	Data Item		GSL08	29 Aug 2001	

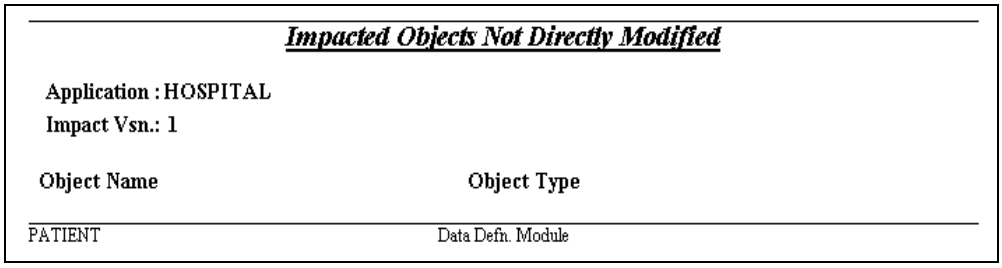
Figure 3-50 Data Item Inventory for Manual Modification Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area
Line No.	The Natural line number of the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
Category	The category for each change, in this case: Manual.
Type	Identifies the type of change e.g., length increase, system date or edit mask.
Length Increase	The increase required to the length of the field.
User	Identifies the User ID that last changed the category, type or comment. Natural Engineer uses the user ID {IMPACT} to identify its default categories.

REPORT ITEM	DESCRIPTION
Last Update	The date that field information was last modified.
Date of Execution	The date that the element was remedied using Natural Engineer.

Impacted Objects Not Directly Modified

This report identifies objects that were impacted, but not directly modified. You must copy these objects to the Modification library and re-STOW them. The following Figure 3-51 Impacted Objects Not Directly Modified Report.



Impacted Objects Not Directly Modified

Application : HOSPITAL
Impact Vsn.: 1

Object Name	Object Type
PATIENT	Data Defn. Module

Figure 3-51 Impacted Objects Not Directly Modified Report

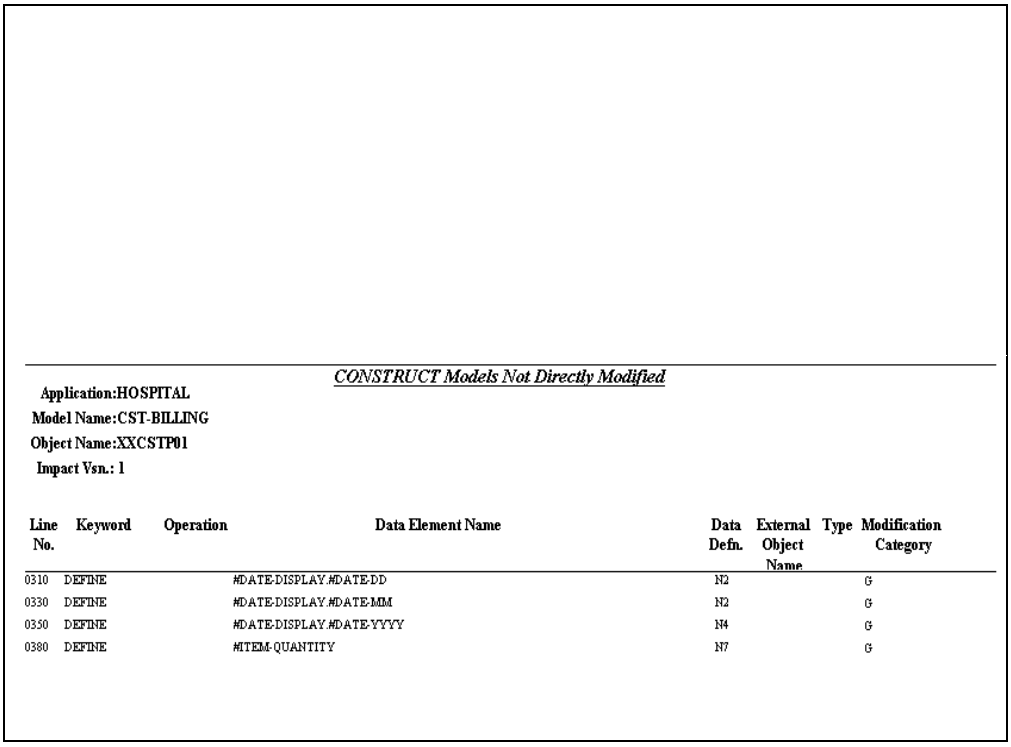
REPORT ITEM	DESCRIPTION
Application	The name of the Application being processed.
Object Name	The name of the Object.
Object Type	Identifies the type of Natural object, e.g., Map, Program, Local Data Area.

Construct Models not Directly Modified

This report identifies any Construct models that have data items to Modify passed to them.

The owner of the model can determine if there is a replacement module, or whether a change to the impacted model is required.

The following Figure 3-52 Construct Model not Directly Modified Report.



CONSTRUCT Models Not Directly Modified

Application:HOSPITAL
Model Name:CST-BILLING
Object Name:XXCSTP01
Impact Vsn.: 1

Line No.	Keyword	Operation	Data Element Name	Data Defn.	External Object Name	Type	Modification Category
0310	DEFINE		#DATE-DISPLAY.#DATE-DD	N2			G
0330	DEFINE		#DATE-DISPLAY.#DATE-MM	N2			G
0350	DEFINE		#DATE-DISPLAY.#DATE-YYYY	N4			G
0380	DEFINE		#ITEM-QUANTITY	N7			G

Figure 3-52 Construct Model not Directly Modified Report

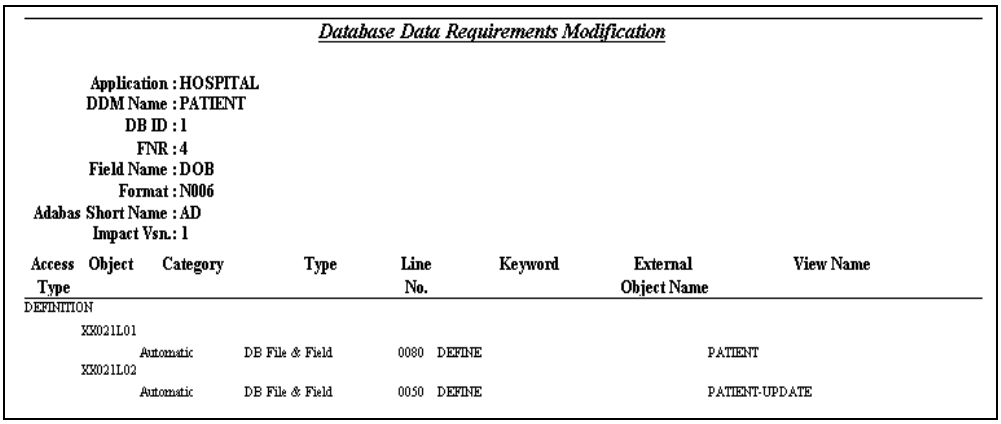
REPORT ITEM	DESCRIPTION
Application	Identifies the name of the Application being processed.
Model Name	The name of the model.

REPORT ITEM	DESCRIPTION
Object Name	The name of the Object.
Line No.	The Natural line number for the statement.
Keyword	The keyword used to reference the Data Element on the line.
Operation	The Natural Engineer defined relationship for the statement.
Data Element Name	The name of the field used in the object, locally or from a View.
Data Defn.	Data Definition. The format and length of the Data Element.
External Object Name	The name of the object that contains the definition of the Data Area used within the object. i.e., External Local Data Area.
Type	The type of external object.
Remedy Category	The process option for the change.

Database Data Requirements Modification

This report identifies DDM and fields impacted in remedied objects.

The following Figure 3-53 Database Data Requirements Modification Report.



Database Data Requirements Modification

Application : HOSPITAL
DDM Name : PATIENT
DB ID : 1
FNR : 4
Field Name : DOB
Format : N006
Adabas Short Name : AD
Impact Vsn.: 1

Access Type	Object	Category	Type	Line No.	Keyword	External Object Name	View Name
DEFINITION							
	XX021L01						
		Automatic	DB File & Field	0080	DEFINE		PATIENT
	XX021L02						
		Automatic	DB File & Field	0050	DEFINE		PATIENT-UPDATE

Figure 3-53 Database Data Requirements Modification Report

REPORT ITEM	DESCRIPTION
Application	The name of the application being processed.
DDM Name	The name of the DDM used to access the database.
DB ID	The number of the database.
FNR	The number of the file.
Field Name	The name of the database field
Format	The format and length of the data item
ADABAS Short Name	The ADABAS 2 byte name for the field
Impact Vsn.	The version of impact that the results relate to
Access Type	The type of Natural statement used to access the view, i.e. FIND, STORE.
Object Name	The name of the object.
Category	The modification category associated with the field

REPORT ITEM	DESCRIPTION
Type	The modification type associated with the field
Line No.	The Natural line number for the statement.
Keyword	The keyword used to reference the Data Element on the line.
External Object Name	The name of the object that contains the definition of the Data Area used within the object. i.e., External Local Data Area.
View Name	The name of the View used to access the database.

INDEX

M

Q

S